Service Manual

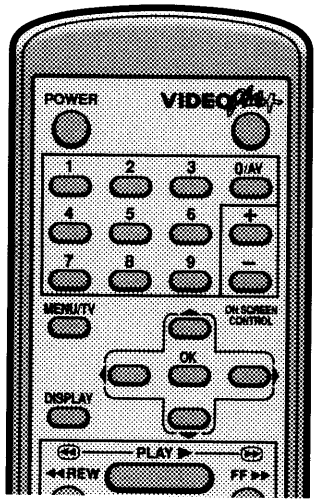
TEUKR Part No. TP30033

Part number for Mechanism
Service Information TP30036

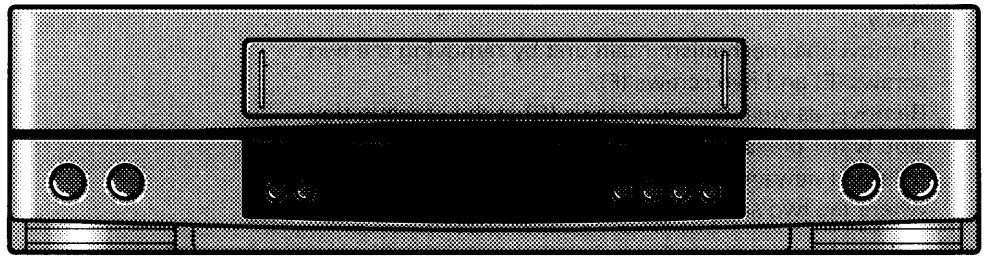
Video Cassette Recorder

THORN

VR182LV



RCV8500



VHS PAL

Contents

1. DISASSEMBLY 2
2. ELECTRICAL ADJUSTMENT 6
3. TEST POINT FOR TAPE PATH ADJUSTMENT 14
4. PARTS LIST
   - ACCESSORIES 16
   - PACKING MATERIALS 16
   - CABINET & CHASSIS PARTS 16
   - MECHANISM PARTS 17
   - ELECTRICAL PARTS 20

CIRCUIT DIAGRAMS (Refer to the separate volume)

PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage and voltage ratings shown.

NOTE: 1. Parts order must contain Model Number, Part Number and Description.
2. N.S.P.: Not available as service parts.

1. DISASSEMBLY

1-1. REMOVAL OF CABINET, MECHANISM UNIT AND MAIN BOARD

REMOVING THE CABINET PARTS (Fig. 1.1.1)

1. Remove the cabinet and bottom cover by removing the four screws (A) and five screws (B).
2. Remove the front panel by removing the locks of the clamps (C) using a screwdriver, etc. and slightly rotating the bottom part in the direction of the arrow.

NOTE: Electrical adjustments for the this model can be performed with only the cabinet removed. •

REMOVING THE MECHANISM MAIN UNIT (Fig. 1.1.2)

After removing the cabinet parts:

1. Remove the two screws (D), and then remove the bracket.
2. Remove the 29-wire flat cable from the MC-2 PWB, and then remove the 8-wire flat cable from the VP-1 PWB Ass'y.
3. Remove the mechanism main unit by removing the two screws (E) and two screws (F).
   Remove, as well, the two screws (G) at the cassette tray side while pressing the tray lock lever as shown in the enlarged view and pushing the cassette tray to the position where the two screws (G) appear.

REMOVING THE CP-1 PWB ASSEMBLY (Fig. 1.1.3)

After removing the cabinet parts and the mechanism unit:

1. Pull out the TM-1 PWB Ass'y from CN301 and CN302 while pressing and spreading out the four clamps (H) as shown by the arrows.
2. Remove the holder set to the opening of the chassis, while pressing the clamp in the direction of the arrow.
3. Remove the two red screws (J). Next, remove the CP-1 PWB Ass'y by lifting it straight up while pressing and spreading out the two clamps (K) as shown by the arrows.

M-TE1L/E-1

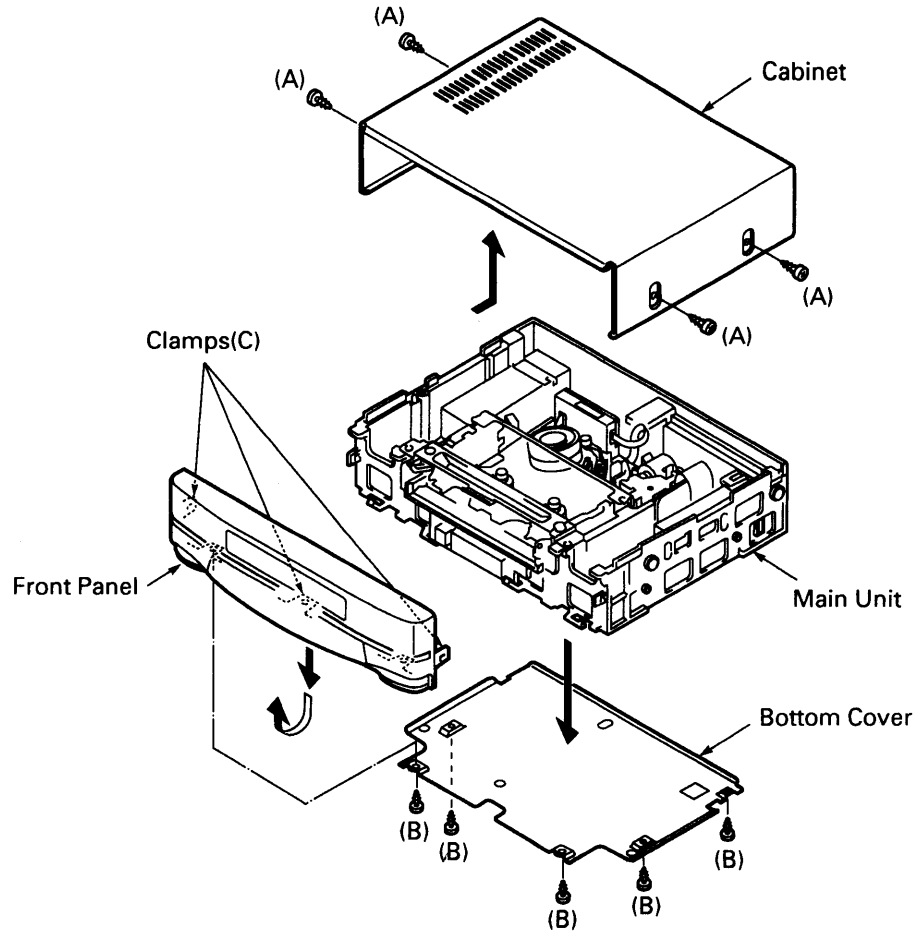


Fig. 1.1.1

M-TP1L/E-TH-2

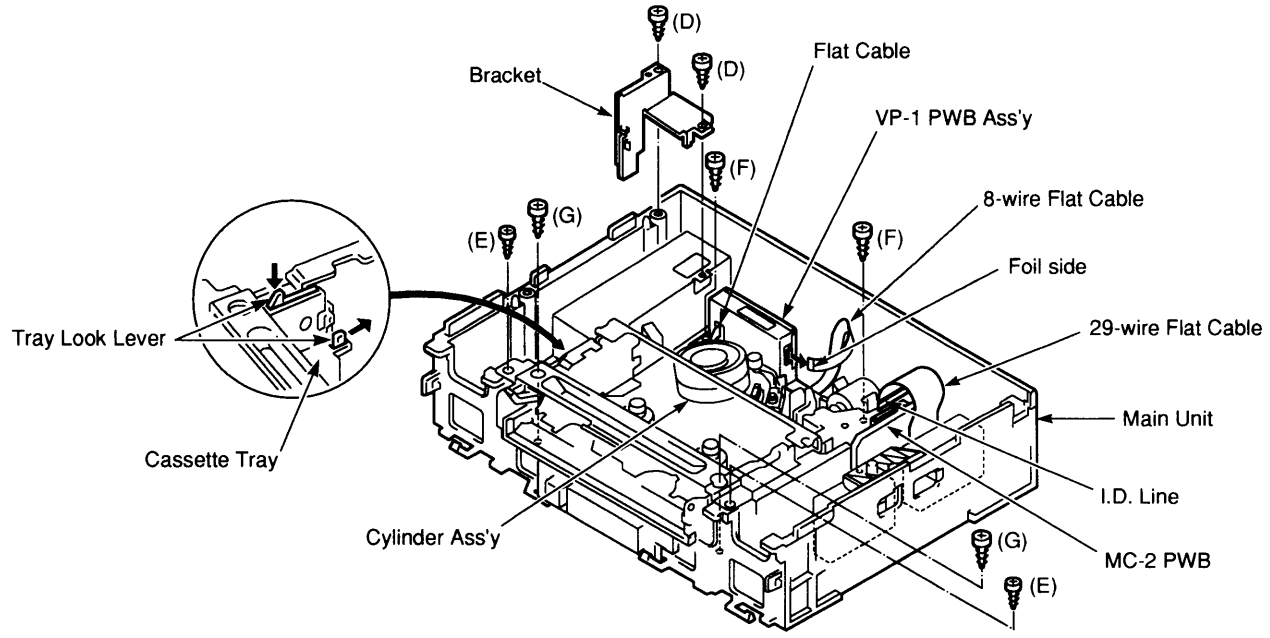


Fig. 1.1.2

M-TP1L/E-TH-3

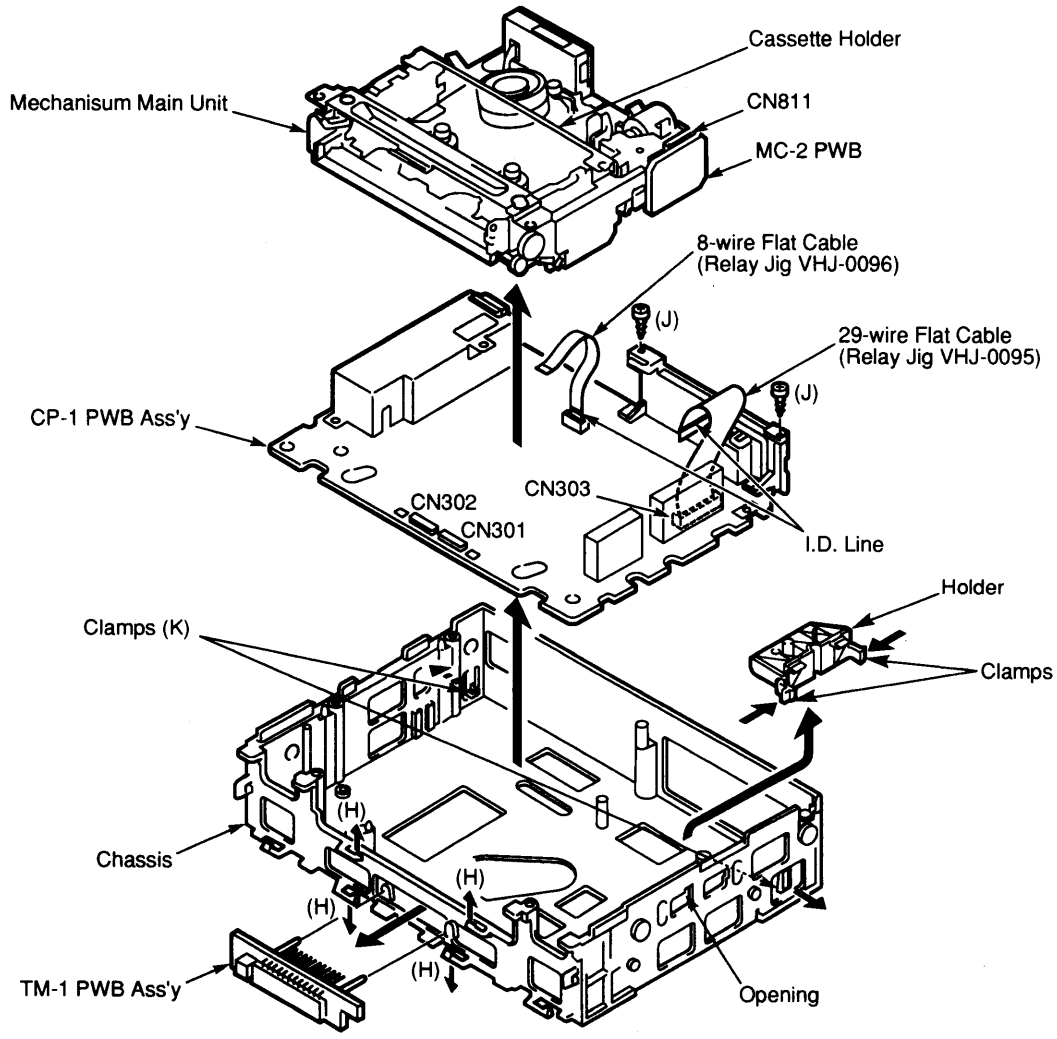


Fig. 1.1.3

TEMPORARILY SETTING UP AND CONNECTING MAIN PWB ASSEMBLY

The following is an example of how to place and connect the main PWB not requiring a jig, when repairing the CP-1 PWB assembly (Fig. 1.1.4)

1. Place the mechanism main unit at the fixed position on the chassis.
2. Connect the 29-wire flat cable to the MC-2 PWB , and the 8-wire flat cable to the VP-1 PWB Ass'y respectively. Connect the TM-1 PWB Ass'y to operate the VCR by using the remote control.
3. Place the CP-1 PWB Ass'y above the mechanism main unit along the cassette holder. Insert the tip (L) of the terminal board into the opening (M) at the side of the chassis, as shown in the enlarge view.

M-TP1L/E-TH-4

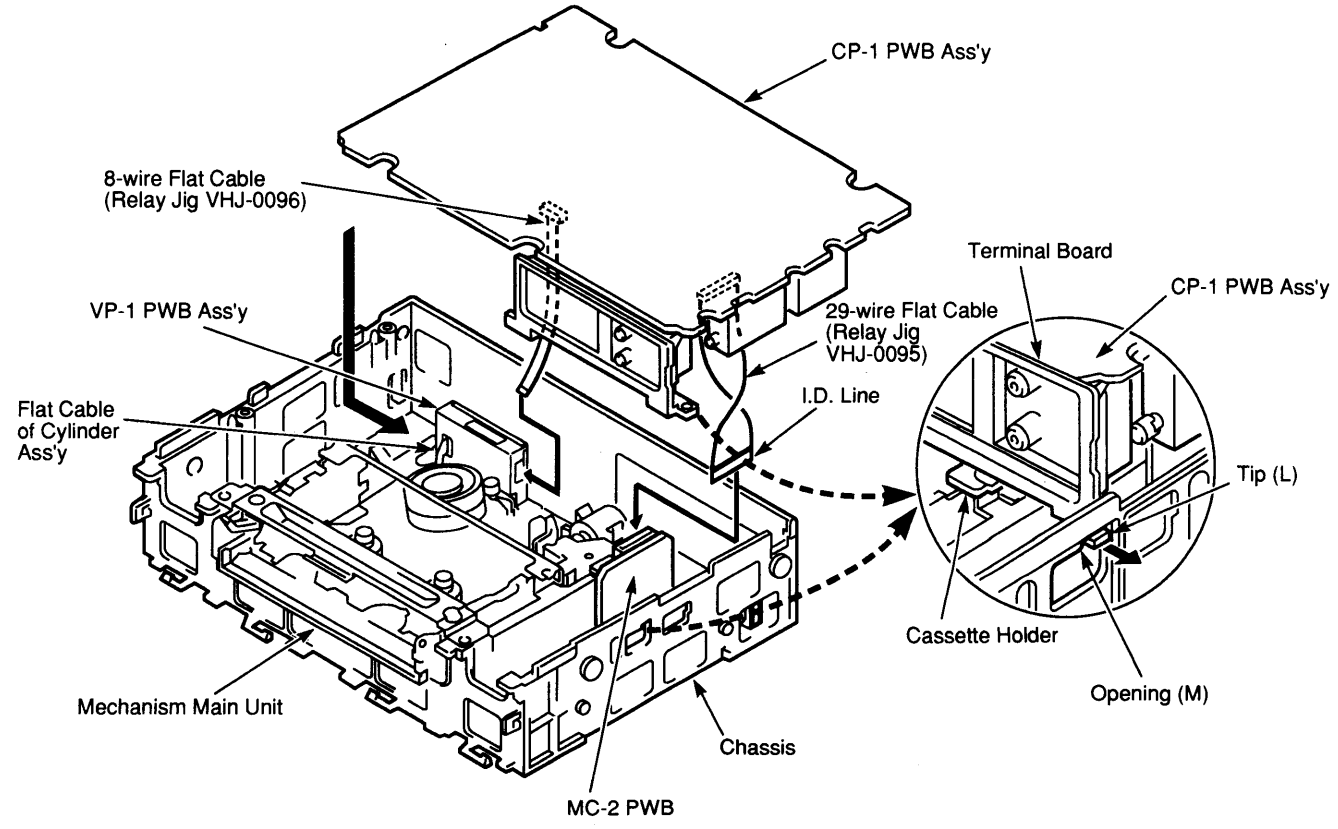


Fig. 1.1.4

1-2. MAIN CIRCUIT BOARD LOCATIONS

L-TP4/IR(21)

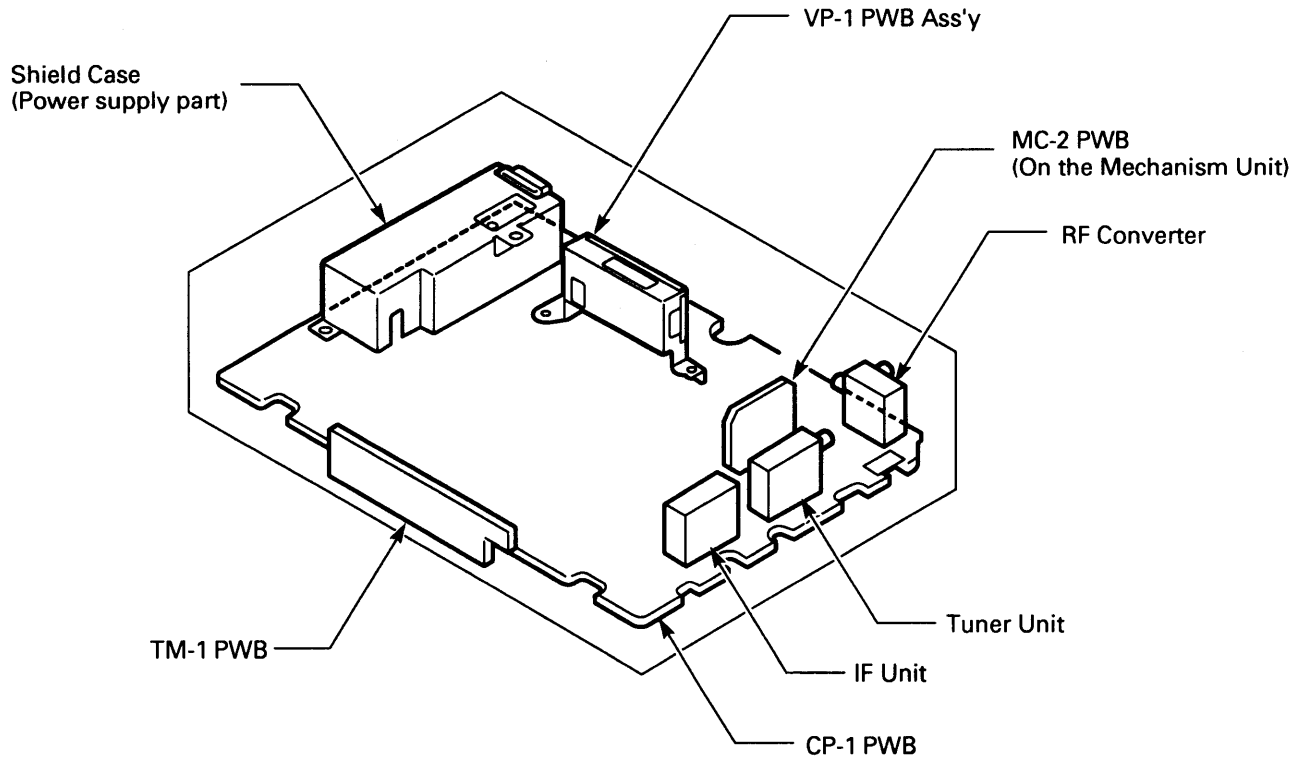


Fig. 1.2.1

2. ELECTRICAL ADJUSTMENT

PREPARATION

This VCR need 4 basic presetting by using the menus displayed on-screen.
After all connection have been made, then follow steps 1 to 4 to preset the VCR.
The 4 presetting steps will be displayed in sequence on TV screen. The setting are entered with the remote control.

Turn on the VCR

1. Adjusting the TV receiver to the video channel: The WELCOME screen will appear. When the video channel has been preset, press the OK button on the remote control.
2. Language selection: Select the desired language, then press the OK button.
3. Clock setting: Using the remote control numeric buttons, enter the date and time, press the OK button.
4. Tuning control adjustments: When the channel position has been preset, press the MENU/TV button.
   When steps 1 to 4 have been finish, ready to operate the all operating mode.

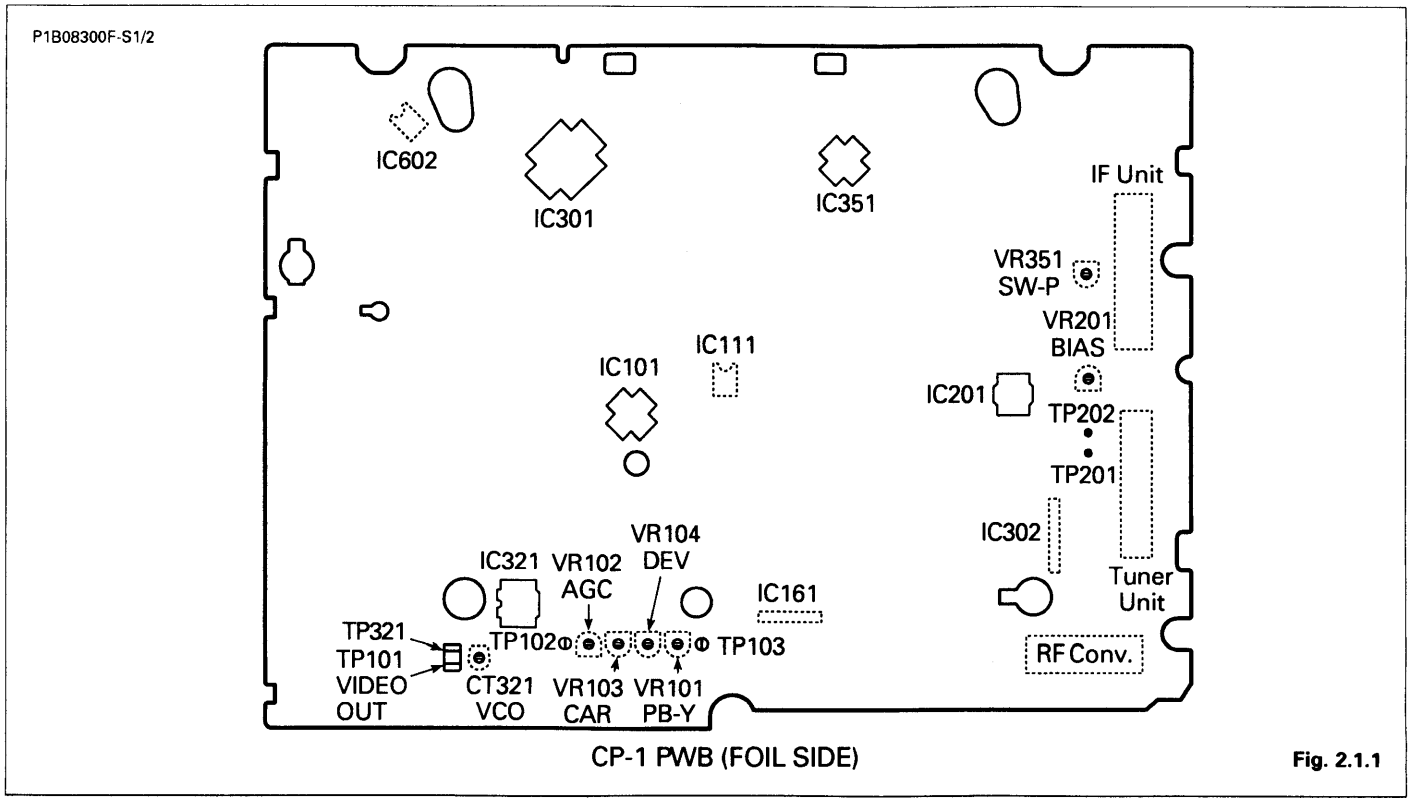
2-1. SERVO CIRCUIT ADJUSTMENT

- These adjustments should be carried out upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustment) are carried out after these adjustments, follow the procedures again in Section 2-1-3. SWITCHING POSITION ADJ.
- When a cassette tape is loaded, auto-tracking will be set immediately after starting the first playback. As this will deviate the tracking center set, be sure to press the channel buttons (+) or (–) once directly after starting playback to prevent auto-tracking from being set.

2-1-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Oscilloscope	Vertical sensitivity: 5 mV/DIV, external trigger Band width: more than 10 MHz
Test Tape	VHJ-0009 or VHJ-0023: SP mode, monoscope, 6 KHz
Blank Tape	VHS-type cassette tape
Monitor TV	

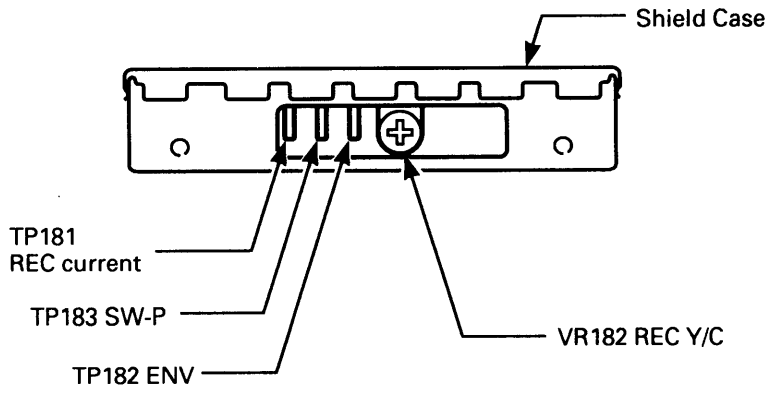
2-1-2. LOCATION OF ADJUSTMENT POINTS



CP-1 PWB (FOIL SIDE)

Fig. 2.1.1

P1B08800C-S1



VP-1 PWB ASS'Y

Fig. 2.1.2

NOTE:

- Self-recording means "Record any broadcasting or video signal and play back the just-recorded portion".

2-1-3. SWITCHING POSITION ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP101 (VIDEO OUT) TP183 (SW-P)	Oscilloscope	PLAY(SP)mode Test tape (VHJ-0009 or VHJ-0023)

ADJ. Location	ADJ. Value
VR351 (SW-P)	6.5 H ± 0.5 H

1. Set the tracking control position to the center by pressing CHANNEL buttons (+) and (–) simultaneously. (Tracking center position display in the indicator panel "T –:– ")
2. Adjust VR351 (SW-P) so that the width "T" becomes **6.5 H ± 0.5 H** as shown in Fig. 2.1.3.

WFS101

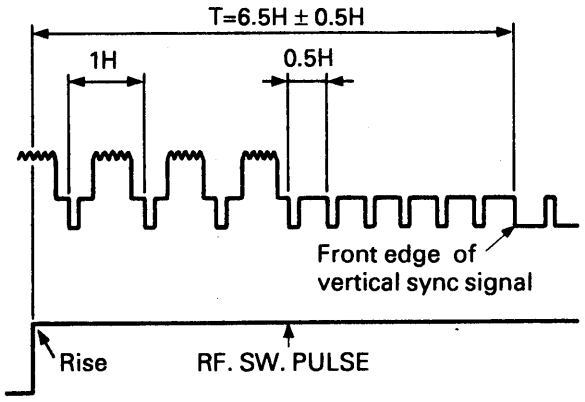


Fig. 2.1.3

2-1-4. STILL V-LOCK ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Color bar generator or Broadcasting Monitor	Self-recording (SP mode) STILL mode Blank tape
		Self-recording (LP mode) STILL mode Blank tape

ADJ. Location	ADJ. Value
CHANNEL (+) button CHANNEL (–) button	The minimum vertical shake

1. Play back the just-recorded portion and then set the VCR in the STILL mode.
2. Press the CHANNEL (+) button or the CHANNEL (–) button so that any vertical shake of the picture is brought to its minimum.

2-2. VIDEO CIRCUIT ADJUSTMENT

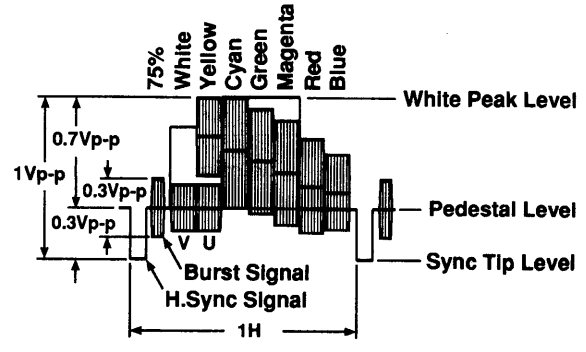
- Before making the following adjustments, Section 2-1. SERVO CIRCUIT ADJUSTMENT should be completed.
- Use the relay jig to provide simple adjustment of the VP-1 PWB Ass'y.

2-2-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Color Bar Signal Generator	PAL Color bar signel with 100% white level (EBU color bar signel) (Signal waveform is described below. Refer to Fig. 2.2.1)
Oscilloscope	Vertical sensitivity: 5 mV/DIV, external trigger Band width: more than 10 MHz
Digital Voltmeter	DC range
Test Tape	VHJ-0008 or VHJ-0023: SP mode, color bar, 1kHz (Color bar signal waveform is described below. Refer to Fig. 2.2.3)
Blank Tape	VHS-type cassette tape
Oscilloscope Probe	Input capacity: less than 25 pF (10:1) less than 40 pF (1:1) Covering frequency: DC ~ 40 MHz (10:1) DC ~ 30 MHz (1:1)
Frequency Counter	8 significant digits
Adjustment Relay Jig	VHJ-0065: 5-wire flat cable for VP-1 PWB Ass'y

PAL TV TEST SIGNAL

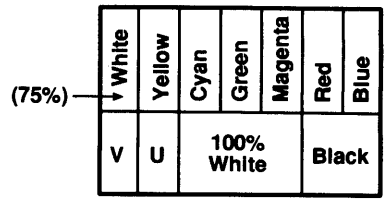
WPV-SCS



COLOR BAR SIGNAL WAVEFORM

Fig. 2.2.1

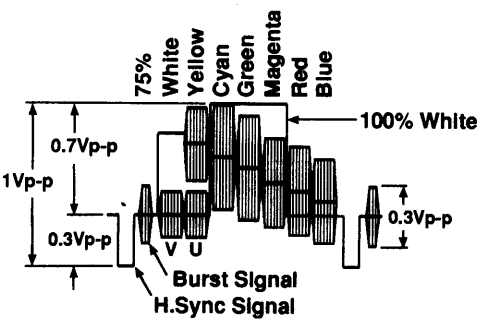
WPV-SCP



COLOR BAR PATTERN MONITOR TV

Fig. 2.2.2

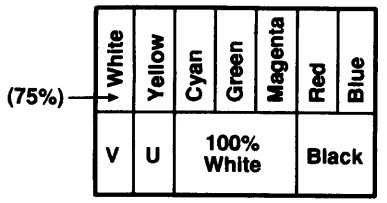
WPV-TCS



COLOR BAR SIGNAL WAVEFORM (VHJ-0008)

Fig. 2.2.3

WPV-TCP

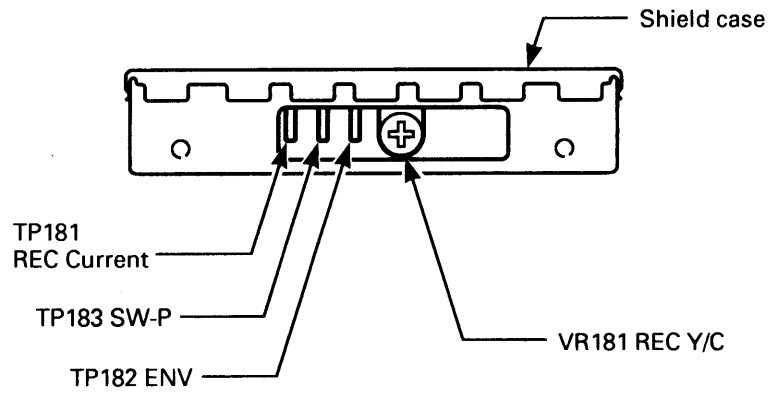


COLOR BAR PATTERN (VHJ-0008) ON MONITOR TV

Fig. 2.2.4

2-2-2. LOCATION OF ADJUSTMENT POINTS

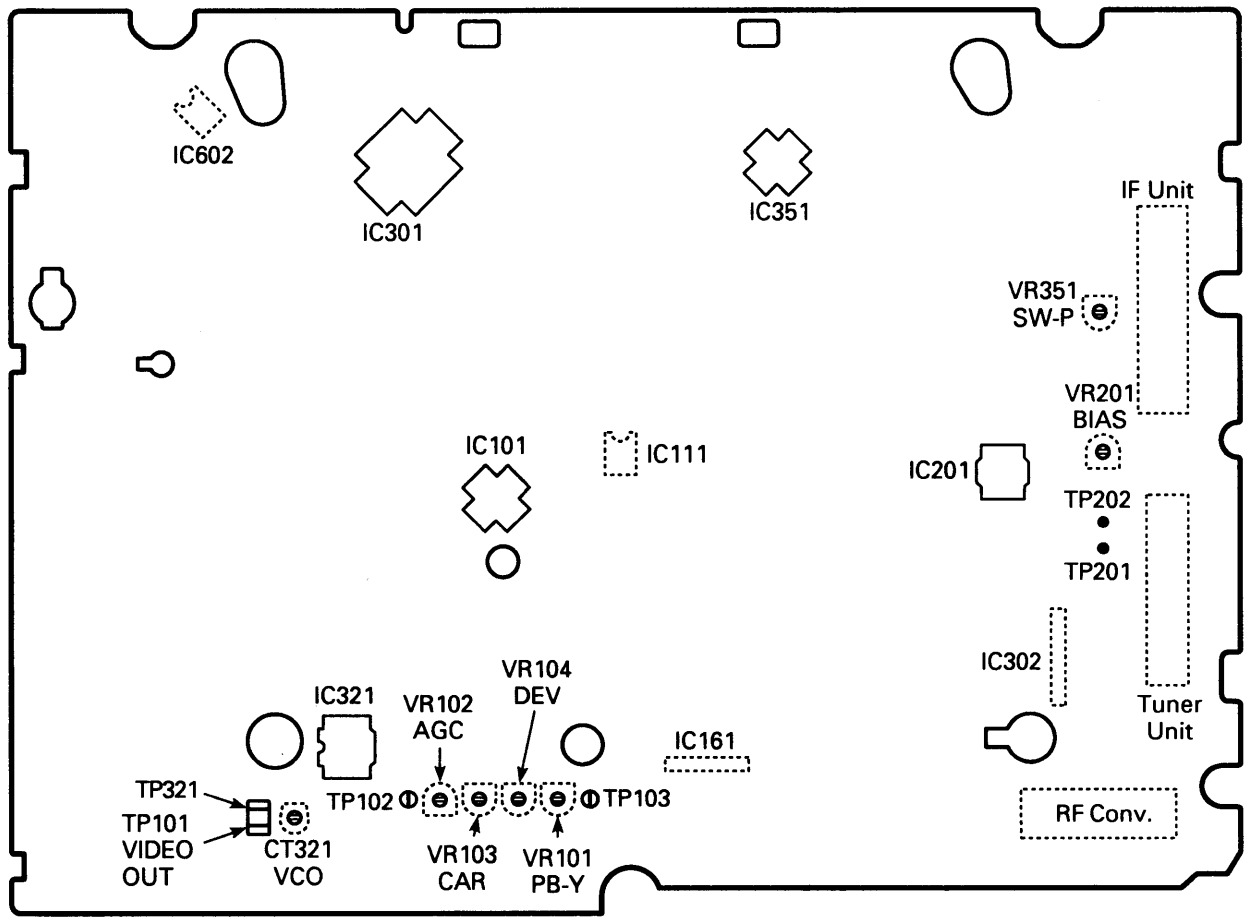
P1B08800C-V1



VP-1 PWB ASS'Y

Fig. 2.2.5

P1B08300F-V1/2



CP-1 PWB (FOIL SIDE)

Fig. 2.2.6

2-2-3. ADJUSTMENT RELAY JIG

Connect the Flat cable end from the Cylinder Ass'y to the VP-1 PWB Ass'y using the Relay jig to provide simple repairing and adjustment of the VP-1 PWB Ass'y, as shown in Fig. 2.2.7. Further, when adjusting the VP-1 PWB Ass'y, be sure to make contact an end of Shield case with Bracket of the VP-1 PWB Ass'y to maintain the shield effect. If the VP-1 PWB Ass'y does not contact, there is insufficient ground and no proper play back image can be obtained.

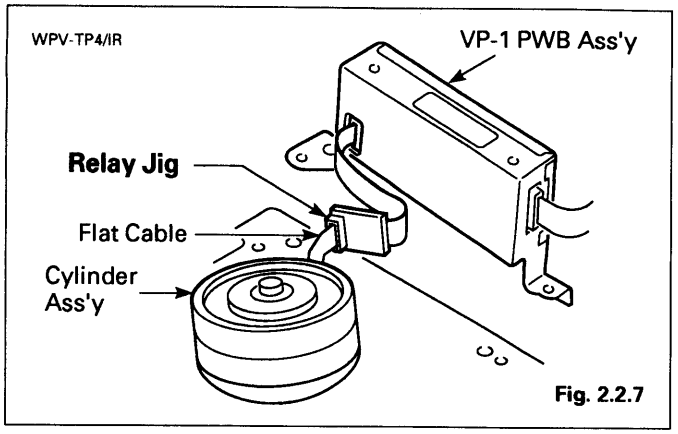


Fig. 2.2.7

NOTES:

- Self-recording means "Record the video signal and play back the just-recorded portion".
- Connect the monitor TV to the VIDEO OUTPUT terminal (EURO-AV terminal pin 19), before making following adjustments.

2-2-4. AGC LEVEL ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP102	Color bar generator Oscilloscope (10:1 probe)	E-E mode

ADJ. Location	ADJ. Value
VR102 (AGC)	0.5 Vp-p ± 0.025 Vp-p

1. Connect the color bar generator to the VIDEO INPUT terminal (EURO-AV pin20).
2. Adjust VR102 (AGC) for **0.5 Vp-p ± 0.025 Vp-p** as shown in Fig. 2.2.8.

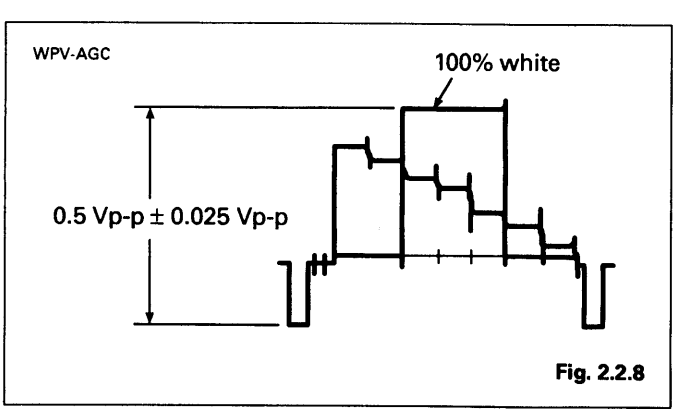


Fig. 2.2.8

2-2-5. PB-Y LEVEL ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP101	Oscilloscope	PLAY(SP)mode Test tape (VHJ-0008 or VHJ-0023)

ADJ. Location	ADJ. Value
VR101 (PB-Y)	1 Vp-p ± 0.05 Vp-p

1. Play back a test tape in SP mode.
2. Adjust VR101 (PB-Y) for the video luminance signal level of **1 Vp-p ± 0.05 Vp-p**. (Refer to Fig. 2.2.9)

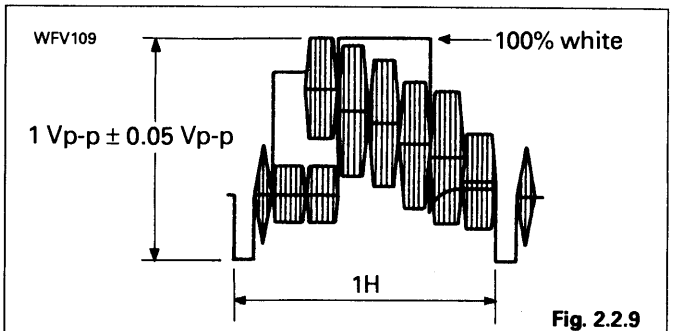


Fig. 2.2.9

2-2-6. CARRIER SET ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP103	Color bar generator Frequency counter	REC (SP) mode

ADJ. Location	ADJ. Value
VR103 (CAR)	3.83 MHz ± 0.05 MHz

1. Connect the color bar generator to the VIDEO INPUT terminal (EURO-AV pin 20).
2. After removing the first color bar signal input from the video input terminal, immediately adjust VR103 (CAR) so that the frequency becomes 3.83 MHz± 0.05 MHz.

2-2-7. VCO (on screen assist) ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP321	Color bar generator Digital voltmeter	E-E mode

ADJ. Location	ADJ. Value
CT321 (VCO)	2.5 Vp-p ± 0.3 Vp-p

1. Connect the digital voltmeter (DC range) to TP321 and GND.
2. Adjust CT321(VCO) so that the voltage is 2.5 V ± 0.3 V.

2-2-8. DEVIATION ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP101	Color bar generator Oscilloscope	Self-recording (SP) mode Blank tape

ADJ. Location	ADJ. Value
VR104 (DEV)	1 Vp-p ± 0.05 Vp-p

1. Record the color bar signal on the blank tape.
2. Play back of the just-recorded portion.
3. Adjust VR104 (DEV) for **1 Vp-p ± 0.05 Vp-p** as shown in Fig. 2.2.10.
4. If the adjustment value is not satisfactory, adjust VR104 (DEV) and repeat steps 2 to 3.

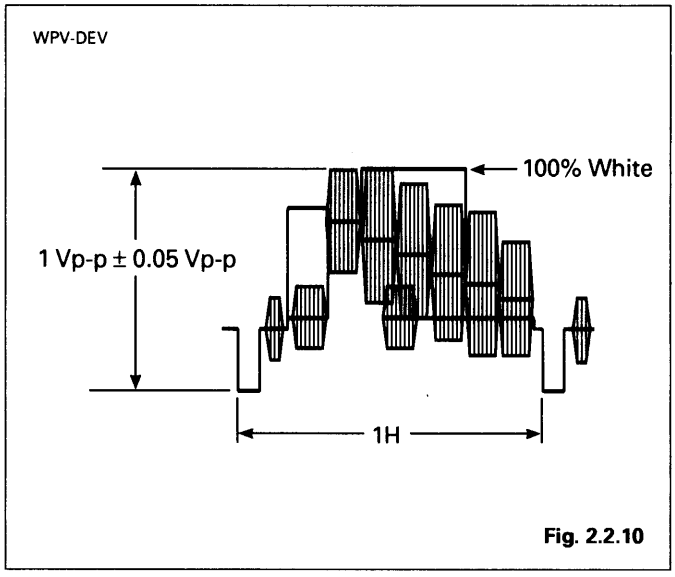


Fig. 2.2.10

2-2-9. Y/C REC CURRENT ADJ.

Measuring Point	Measuring Equipment	ADJ. Condition
TP181 (on VP-1 PWB)	Color bar generator Oscilloscope (1:1 probe)	REC(SP)mode Blank tape

ADJ. Location	ADJ. Value
VR182 (REC-Y/C)	500 mVp-p ± 25 mVp-p

1. Connect the ground of the oscilloscope to the shield case of the VP-1 PWB Ass'y.
2. Adjust VR182 (REC-Y/C) so that the video luminance signal level at the sync tip is **500 mVp-p ± 25 mVp-p**. (Refer to Fig. 2.2.11)

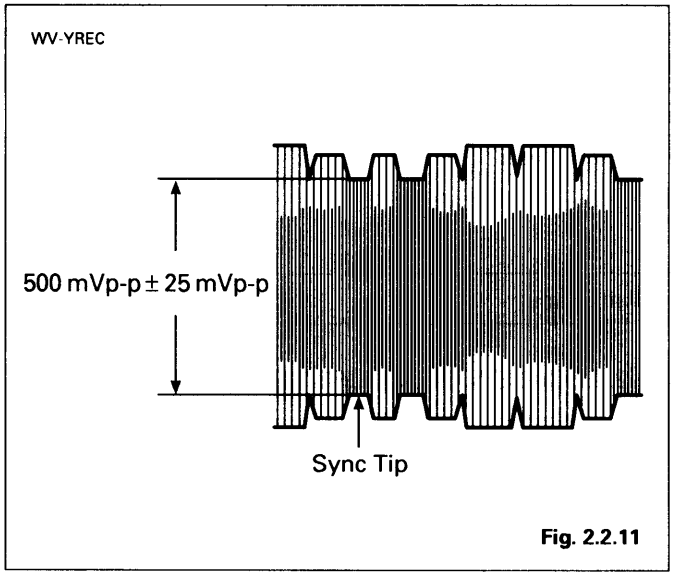


Fig. 2.2.11

2-3. AUDIO CIRCUIT ADJUSTMENT

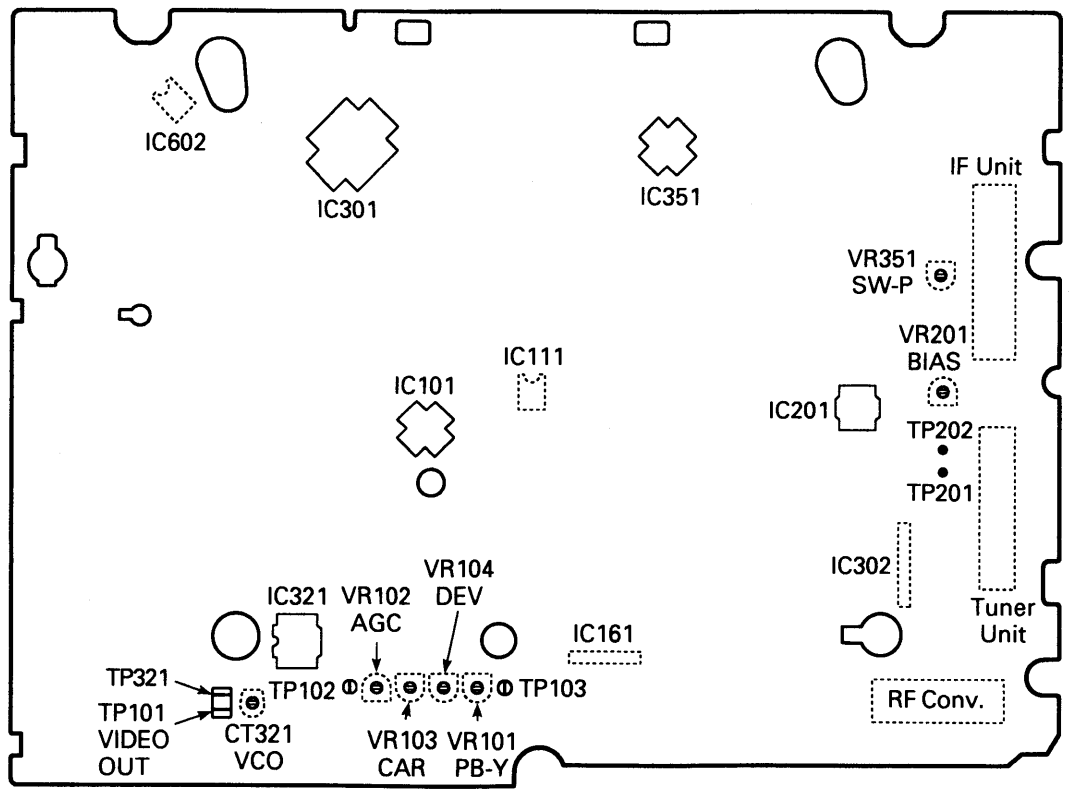
- Before making these adjustments, (especially, the tape guide height and audio control erase head height adjustments) should be carried out, so that the tape traveling between the loading guide pole and the audio control erase head runs without fluttering, twisting, curling.
- Before making these adjustments, Section 2-1. SERVO and Section 2-2. VIDEO circuit adjustments should be carried out.

2-3-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Standard Audio Signal Generator (SG)	Output frequency : 10 Hz ~ 20 kHz Output level : more than 1 Vrms Output impedance : 600 Ω Distortion ratio : less than 0.1% Output in use SG : Frequency: ..... 1 kHz, 10 kHz (switchable) Output level: ..... –33.8 dBs ± 0.5 dB
Color Bar Signal Generator	Color bar signel with 100% white level. (Signal waveform is described before. Refer to Fig. 2.2.1)
Oscilloscope	Vertical sensitivity : 10 mV/DIV Band width : more than 30 MHz
AC Voltmeter	Effective value indication Input frequency : 10 Hz ~ 20 kHz Input Impedance : more than 1 MΩ Measurement level : 1mV (full scale)
Blank Tape	VHS-type cassette tape

2-3-2. LOCATION OF ADJUSTMENT POINTS

P1B08300F-A1/2



CP-1 PWB (FOIL SIDE)

Fig. 2.3.1

NOTE:

- Self-recording means "Record the audio signal and play back the just-recorded portion".

2-3-3. BIAS LEVEL ADJ.

[A]

Measuring Point	Measuring Equipment	ADJ. Condition
TP201 (HOT) TP202 (GND)	Oscilloscope AC voltmeter	REC (SP) mode Blank tape

ADJ. Location	ADJ. Value
VR201 (BIAS)	23 mVrms

1. Load the VCR with a blank tape and select the SP record mode without all incoming signal.
2. After confirming on the oscilloscope that a 70 kHz sine wave is being output, adjust VR201 (BIAS) so that the AC voltmeter's reading is **23 mVrms**.

[B]

Measuring Point	Measuring Equipment	ADJ. Condition
AUDIO OUTPUT terminal (EURO-AV pin 3: Lch)	Oscilloscope AC voltmeter Standard audio signal generator (SG: signal –33.8 dBs, 1 kHz –33.8 dBs, 10 kHz)	Self-recording (SP mode Blank tape)

ADJ. Location	ADJ. Value
VR201 (BIAS)	–4 dB ~ +4 dB between 400 kHz and 10 kHz

1. Connect the standard audio signal generator to the AUDIO INPUT terminal (EURO-AV pin6: Lch).
2. Set the standard audio signal generator's output level to –33.8 dBs.
3. Set the standard audio signal generator's frequency to 400 Hz and then 10 kHz. Record each of these frequency signals.
4. Play back each of the just-recorded portion.
5. Confirm that the 10 kHz level on AC voltmeter's reading is **from –4 dB to +4 dB**, compared with 400 Hz level.
6. If the 10 kHz level is less than –4 dB below 400 Hz level or more than +4 dB above 400 Hz level, Rotate VR201 (BIAS) slightly to adjust it.
7. Repeat steps 3 through 6 if necessary.

2-4. TUNER AND IF CIRCUITS ADJUSTMENT

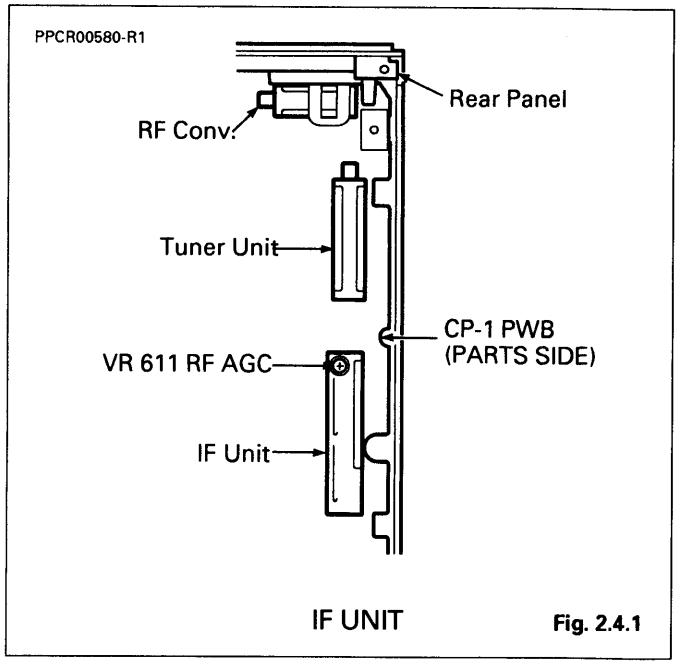
- When any malfunction occurs in the TUNER circuit the whole unit must be replaced.
- An adjustment of the IF circuit is shown as follows.

NOTE: The TUNER unit does not need any adjustments, because precise adjustments have been down before shipment.

2-4-1. TEST EQUIPMENT AND STANDARDS REQUIRED

Monitor TV	

2-4-2. LOCATION OF ADJUSTMENT POINT



IF UNIT

Fig. 2.4.1

2-4-3. RF AGC ADJ.

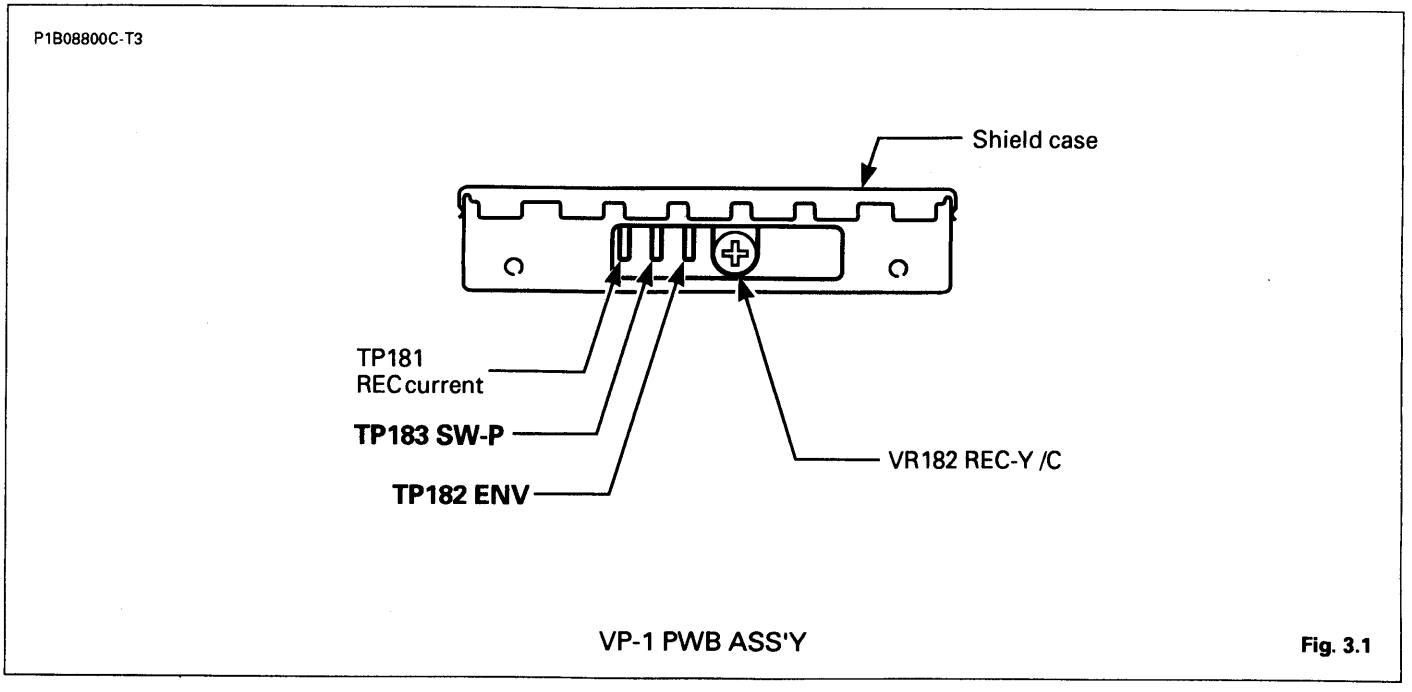
Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	E-E mode

ADJ. Location	ADJ. Value
VR611 (RF AGC) (on the IF circuit)	S/N is best point

1. Connect the monitor TV to UHF ANTENNA OUTPUT terminal.
2. Connect the UHF antenna to UHF ANTENNA INPUT terminal.
3. Receive the middle electrical field (70 dBμ ~ 90 dBμ) of the UHF channel, and slowly turn VR611 (RF AGC) from the point where snow-noise is present to the point where it just disappears from the monitor TV.
4. Confirm by monitor TV that there is no beat and saturation (S/N is best point) when receiving any TV channel.

3. TEST POINT FOR TAPE PATH ADJUSTMENT

Test point TP182 (ENV) and TP183 (SW-P) for tape path adjustment is shown in Figure below.
For adjustment, refer to the Mechanism Service Information (TP30036).



VP-1 PWB ASS'Y

Fig. 3.1

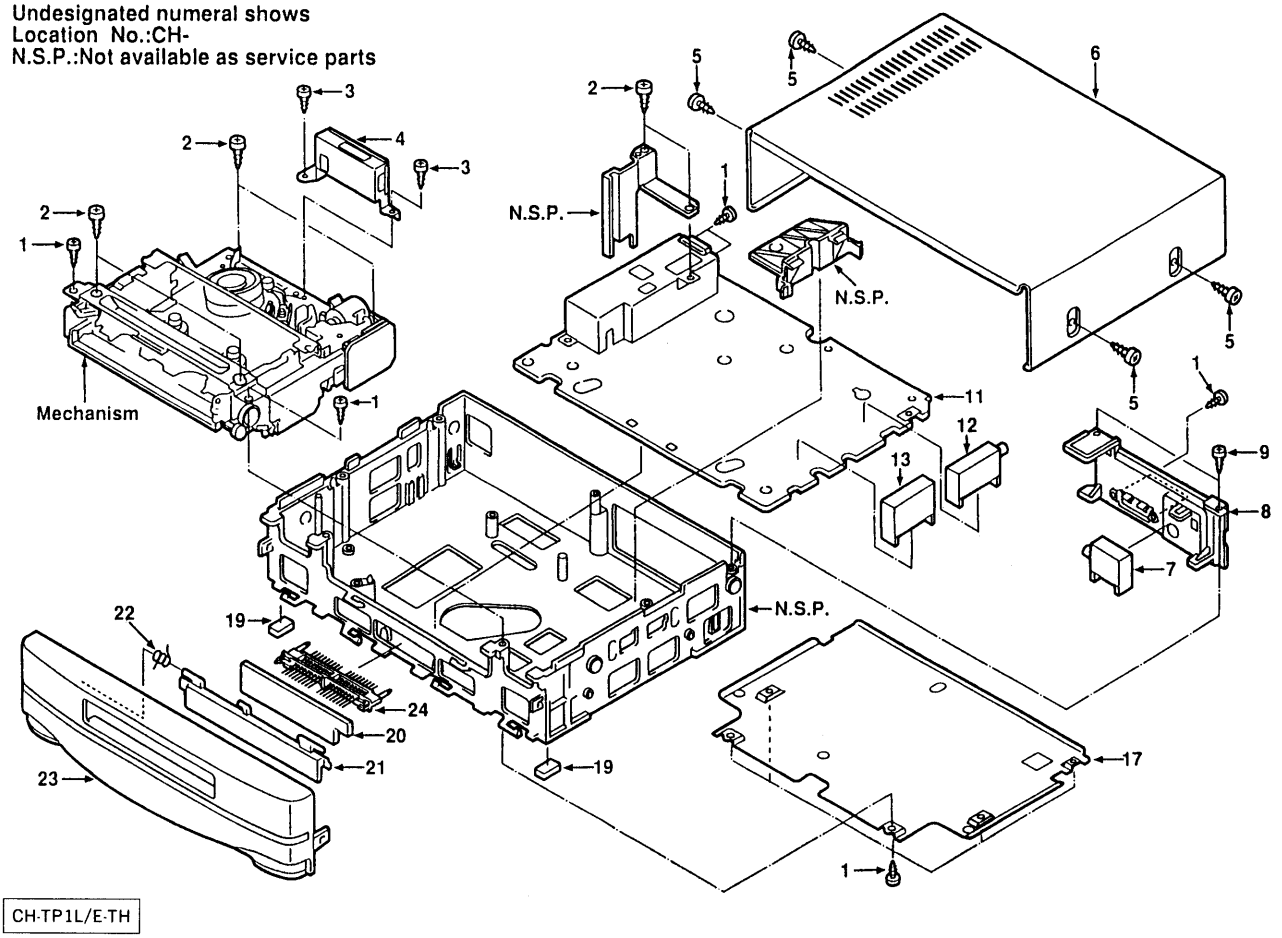
NOTES

4. PARTS LIST

LOCATION	PARTS NO.	DESCRIPTION
ACCESSORIES		
	645 002 8762	REMOCON(WITH COVER BATTERY)
	613 145 3227	COVER BATTERY(FOR REMOCON)
	613 148 7864	INSTRUCTION MANUAL
	613 132 6132	CABLE,ANT
OR	613 132 5975	CORD,ANT
⚠	613 136 6411	CORD,POWER
OR ⚠	613 140 7473	CORD,POWER
**********		
PACKING MATERIALS		
	613 149 2202	CARTON CASE
	613 150 2291	CUSHION,FRONT
	613 150 2307	CUSHION,BACK
	613 099 1768	POLYE COVER,INNER-K
**********		

LOCATION	PARTS NO.	DESCRIPTION
CABINET & CHASSIS PARTS		
CH-1	411 137 0007	SCR L-TPG BIN 3X10
CH-2	411 021 7907	SCR S-TPG BIN 4X12
CH-3	411 027 1701	SCR S-TPG BIN 3X10
CH-4	613 144 7738	COMPL PWB,VP-1
CH-5	412 028 9406	SPECIAL SCREW
CH-6	613 149 6583	COMPL,COVER TOP
CH-7	613 143 8620	MODULATOR,RF
CH-8	613 144 1453	TERMINAL
CH-9	411 021 3800	SCR S-TPG BIN 3X10
CH-11	613 149 4435	COMPL PWB,CP-1-A
CH-12	613 097 3597	TUNER PACK
CH-13	613 135 7884	IF PACK
CH-17	613 139 2182	COVER BOTTOM
CH-19	613 121 1001	STAND,FELT,FRONT
CH-20	613 144 4461	COMPL PWB,TM-1
CH-21	613 150 9153	DOOR CASSETTE
CH-22	613 140 7459	SPRING
CH-23	613 149 2004	ASSY,CABINET FRONT
CH-24	613 141 1395	PLUG,26P

Undesignated numeral shows
Location No.:CH-
N.S.P.:Not available as service parts

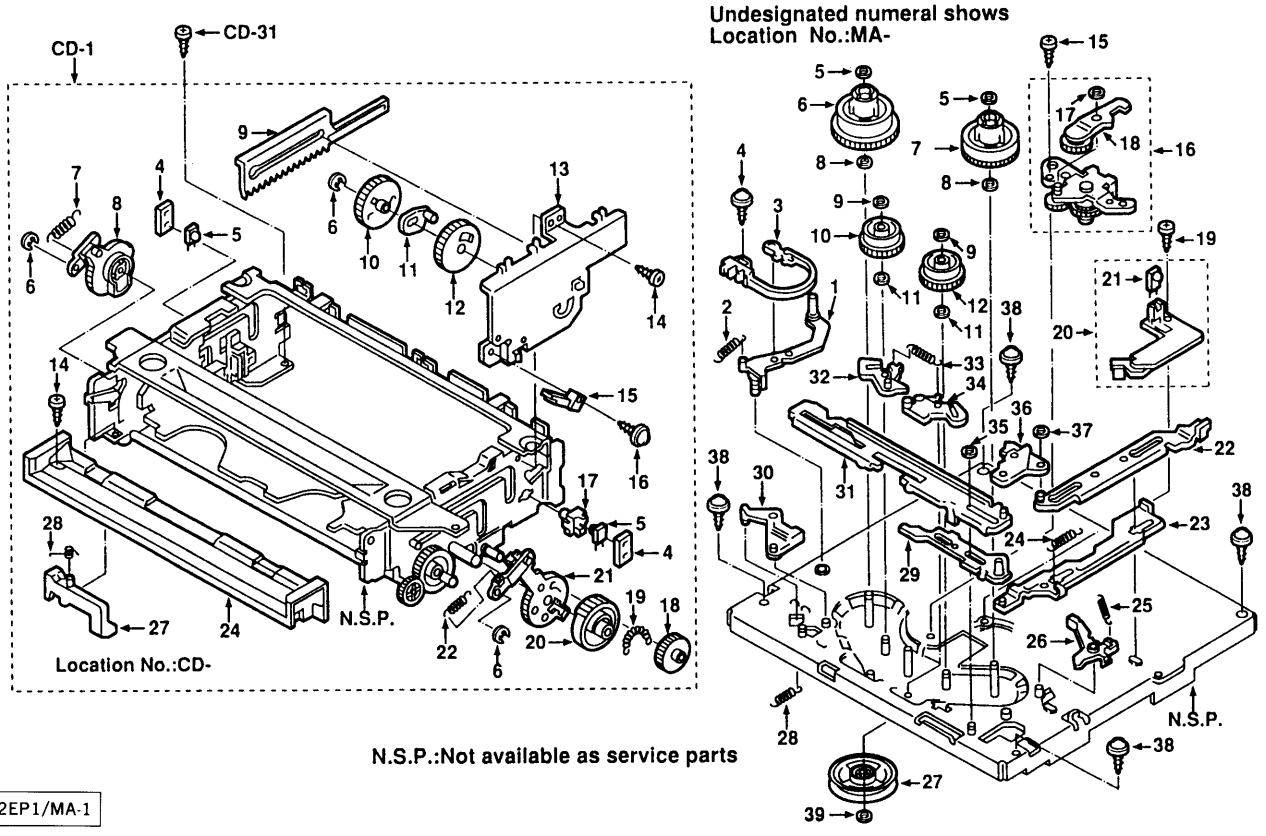


CH-TP1L/E-TH

MECHANISM PARTS

MECHANISM PARTS 1

LOCATION	PARTS NO.	DESCRIPTION
CD-1	613 142 9581	COMPL,CASSETTE MECHANISM
CD-4	613 022 0585	LID
CD-5	407 098 3201	PHOTO COUPLE PN150SAN
CD-6	411 015 9801	RING E 2.3
CD-7	613 022 1643	SPRING,LINK L
CD-8	613 022 0073	ASSY,GEAR,LEVER L
CD-9	613 022 2695	RACK
CD-10	613 141 6109	GEAR,LOCK
CD-11	613 021 9916	ASSY,LEVER,PINION
CD-12	613 022 2626	GEAR,PINION
CD-13	613 021 9657	ASSY,BRACKET,GEAR
CD-14	411 027 1305	SCR S-TPG BIN 2.6X4
CD-15	613 095 0949	SW,SPECIAL
CD-16	411 106 9208	SCR PAN+SW+W 2X9
CD-17	613 022 0943	HOLDER,TRANSISTOR
CD-18	613 022 2619	GEAR,IDLER
CD-19	613 022 1667	SPRING,GEAR MAIN
CD-20	613 022 2596	GEAR,MAIN
CD-21	613 022 0097	ASSY,GEAR,LEVER R
CD-22	613 022 1674	SPRING,LINK R
CD-24	613 022 4064	BOARD,UNDER
CD-27	613 124 5006	LEVER,SAFETY SW
CD-28	613 125 6149	SPRING,SAFETY SW
CD-31	411 001 8702	SCR BIN 3X6
MA-1	613 100 0391	ASSY,LEVER,TENSION
MA-2	613 085 7996	SPRING,LEVER TENSION
MA-3	613 021 9701	ASSY,HOLDER,BAND
MA-4	411 144 2803	SCR PAN+SW+W 2.6X6
MA-5	411 109 1605	WASHER Y 2.6X6X0.25
MA-6	613 135 7068	ASSY,REEL,SUPPLY
OR	613 135 7549	ASSY,REEL,SUPPLY
MA-7	613 135 7075	ASSY,REEL,TAKE UP
OR	613 143 2963	ASSY,REEL,TAKE UP
MA-8	412 021 5306	SPECIAL WASHER 3.1X6X0.3
OR	412 015 8900	SPECIAL WASHER 3.1X6X0.4
OR	412 015 8504	SPECIAL WASHER 3.1X6X0.5
MA-9	411 109 1506	WASHER Y 2.1X6X0.25
OR	411 109 1407	WASHER Y 2.1X5X0.25
MA-10	613 135 7150	GEAR,REEL SUPPLY
OR	613 142 9116	GEAR,REEL SUPPLY
MA-11	412 026 7305	SPECIAL WASHER 2.6X6X0.25
MA-12	613 135 7167	GEAR,REEL TAKE UP
OR	613 142 9109	GEAR,REEL TAKE UP
MA-15	412 042 4302	SPECIAL SCREW 2.6X4
MA-16	613 135 7099	COMPL,IDLER,CLUTCH
MA-17	411 120 1301	WASHER Y 2.1X4X0.25
MA-18	613 135 7082	ASSY,IDLER
MA-19	411 021 3107	SCR S-TPG BIN 2.6X8
MA-20	613 120 9053	COMPL PCB,MC-4
MA-21	407 016 7205	LED LN59
MA-22	613 021 9985	ASSY,SLIDE,ACT PLATE
MA-23	613 142 9086	SLIDE,C BRAKE
MA-24	613 022 1612	SPRING,RETURN SLIDE
MA-25	613 022 1506	SPRING,SUB T
MA-26	613 098 0106	ASSY,BRAKE SUB T
MA-27	613 077 3647	PULLEY,REEL
MA-28	613 022 1490	SPRING,SUB SUPPLY
MA-29	613 022 2374	SLIDE,ACT BRAKE
MA-30	613 084 8871	BRAKE,SUB SUPPLY
MA-31	613 022 0004	ASSY,SLIDE,M PLATE
MA-32	613 080 9216	ASSY,BRAKE,SUPPLY
MA-33	613 086 2914	SPRING,MAIN BRAKE
MA-34	613 080 9209	ASSY,BRAKE,TAKE UP
MA-35	411 109 3005	WASHER Y 2.6X5X0.5
MA-36	613 022 2015	LEVER,CONT PLATE
MA-37	412 015 9501	SPECIAL WASHER
MA-38	411 021 7907	SCR S-TPG BIN 4X12
MA-39	412 045 4606	SPECIAL WASHER 2.4X6X0.25



92EP1/MA-1

MECHANISM PARTS 2

LOCATION	PARTS NO.	DESCRIPTION
DR-1	613 137 5789	COMPL,CYLINDER,2N2P-L
DR-2	411 038 1608	SCR PAN+W 3X8
DR-3	613 078 8689	ASSY,CYLINDER,UPR 2N2P-L
DR-4	613 113 1354	ASSY,CYLINDER,LWR 2AL
DR-5	613 097 2170	SPACER,MOTOR 0.3T
DR-6	613 088 9072	BASE,CYLINDER
DR-7	411 047 7509	SCR PAN+FLG 3X6
DR-8	411 047 5000	SCR PAN+FLG 2.6X8
DR-9	613 085 7279	STATOR,MOTOR CYLINDER
OR	613 132 3520	STATOR,MOTOR CYLINDER
DR-10	411 044 8301	SCR PAN+SW 2.3X10
OR	411 044 9209	SCR PAN+SW 2.3X8
DR-11	613 022 4019	ROTOR,MOTOR CYLINDER
DR-12	411 044 9001	SCR PAN+SW 2.3X6
MB-1	613 123 4802	SLEEVE
MB-2	613 053 3227	SPECIAL WASHER
MB-3	613 123 4970	TAPE GUIDE
MB-4	411 004 5302	NUT HEX (3)
MB-5	613 123 9418	CAP
MB-6	613 021 9961	ASSY,SLIDE,ACT PINCH
MB-7	613 021 9800	ASSY,LEVER,CAM PINCH
MB-8	411 109 2008	WASHER Y 3.1X8X0.5
MB-9	613 022 1797	SPRING,ACE HEAD
MB-10	613 144 5741	COMPL,BRACKET,HEAD
MB-11	613 110 1692	SLEEVE,ACE HEAD
MB-12	412 015 8207	SPECIAL NUT (M5)
MB-13	411 120 0007	SCR PAN+SW+W 2.6X5
MB-14	613 120 3631	BRACKET,STOPPER
MB-15	613 022 1582	SPRING,SLIDE BRAKE
MB-16	613 094 9240	COMPL,SLIDE,CAM
MB-17	613 022 1575	SPRING,LINK LOCK
MB-18	613 022 2725	DAMPER
MB-19	613 022 2534	GEAR,FRONT LOAD
MB-20	613 094 1206	ASSY,LEVER,FRONT
MB-21	613 134 2910	GEAR,HELICAL FRONT
MB-22	411 046 8002	SCR PAN+SW+W 2.6X6
MB-23	411 023 2801	SCR S-TPG PAN 2.6X6
MB-24	411 023 3303	SCR S-TPG PAN 2.6X8
OR	411 021 3107	SCR S-TPG BIN 2.6X8
MB-28	613 077 3227	HOLDER,WORM
MB-29	613 027 0382	WASHER
MB-30	613 078 8320	ASSY,WORM,FRONT
MB-31	613 117 0599	BRACKET,HOLDER
MB-32	613 093 9159	PLATE,NUT
MB-33	613 093 8374	DAMPER,MOTOR
MB-34	613 077 3616	DAMPER,WORM
MB-35	613 121 9960	ASSY,LOADING MOTOR
MB-36	613 092 9945	DAMPER,MOTOR
MB-37	613 132 8075	COMPL PCB,MC-3
MB-38	613 143 8439	COMPL PWB,MC-2
MB-39	613 110 0374	ROTARY SWITCH
MB-40	411 126 5303	SCR PAN 2.6X13
MB-41	613 092 9921	ASSY,SLIDE,FRONT
MB-42	613 092 5985	SPRING,LEVER LOAD
MB-43	613 092 5992	SPRING,LEVER ACT
MB-44	613 092 5886	HOLDER,WORM
OR	613 138 8628	HOLDER,WORM
MB-45	613 027 0627	WASHER 2.1X6X0.5
MB-46	613 092 9938	ASSY,WORM,LOAD
MB-47	613 022 2985	BELT,LOADING
MB-48	412 033 4106	WASHER SLIT 2.6X5X0.50
MB-49	613 077 3579	GEAR,HELICAL
MB-50	613 102 9293	ASSY,LEVER,REV GUIDE
MB-51	613 022 1568	SPRING,REVIEW LEVER
MB-52	613 022 0158	COMPL,PINCH ROLLER
MB-53	613 147 9951	SPRING,PINCH ROLLER
MB-54	411 109 2107	WASHER Y 3.6X6X0.5
MB-55	613 078 8160	COMPL,LEVER,ACT BRAKE

Note:

As shown in the figure, the parts supporting the "ASSY, GUIDE, ROLLER" of Location No. MB-61 comes in two types-group A and group B. (Location MB-60 and 61 are the same.) No one part of group A can be replaced by that of group B by itself, but group A and group B can be replaced as a whole as they are interchangeable.

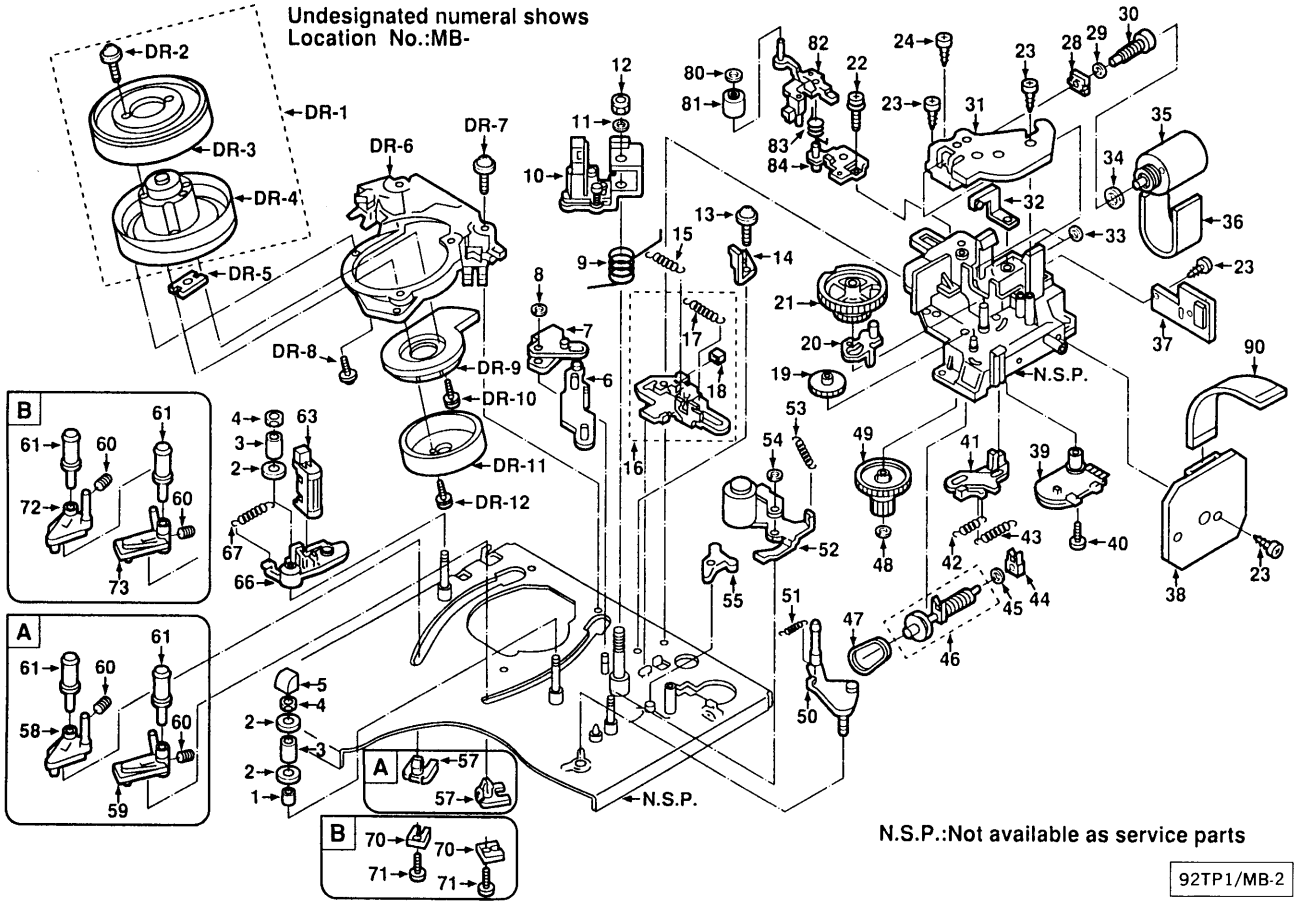
MB-57	613 135 7655	PLATE,BGR
MB-58	613 145 5009	ASSY,MOUNTING,ROLLER S
MB-59	613 145 5016	ASSY,MOUNTING,ROLLER T
MB-60	411 063 0904	SCR SET HEX-SCT 2X3
MB-61	613 022 0233	ASSY,GUIDE,ROLLER
MB-63	645 000 2533	HEAD,FULL ERASE
MB-66	613 136 0532	LEVER,FE HEAD
MB-67	613 022 1698	SPRING,ERASE HEAD
MB-70	613 022 1919	PLATE,GUIDE
MB-71	411 031 1209	SCR BIN 2.6X5
MB-72	613 021 9725	ASSY,BASE,ROLLER S
MB-73	613 021 9732	ASSY,BASE,ROLLER T
MB-80	411 109 1803	WASHER Y 2.6X6X0.5
MB-81	613 119 8562	ASSY,ROLLER,CLEANER
MB-82	613 143 1881	ASSY,LEVER,CLEANER
MB-83	613 119 8593	SPRING
MB-84	613 142 9055	BRACKET,CLEANER
MB-90	613 144 4577	FLEXIBLE FLAT CABLE,CN811-CN303

****

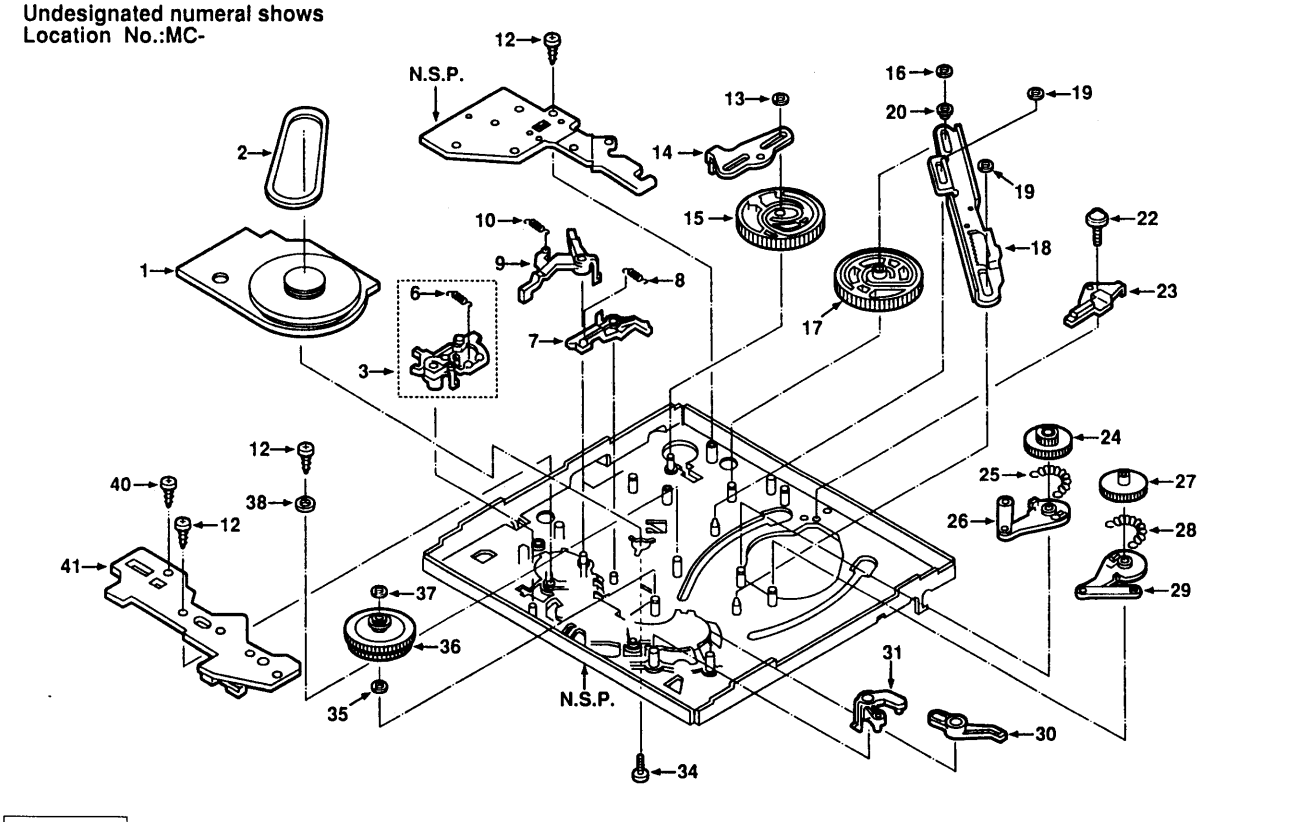
MECHANISM PARTS 3

MC-1	645 000 5053	MOTOR,CAPSTAN DC 3W
MC-2	613 022 2978	BELT,REEL DRIVE
MC-3	613 135 4609	COMPL,LEVER,CLUTCH
MC-6	613 022 1520	SPRING,LEVER CLUTCH
MC-7	613 082 3434	LEVER,CHANGE CLUTCH
MC-8	613 022 1711	SPRING,CHANGE CLUTCH
MC-9	613 081 7518	ASSY,BRAKE CAPSTAN
MC-10	613 098 2285	SPRING,CAPSTAN
MC-12	411 021 3107	SCR S-TPG BIN 2.6X8
MC-13	411 109 2008	WASHER Y 3.1X8X0.5
MC-14	613 142 9093	SLIDE,CAM PLATE
MC-15	613 022 2701	CAM,MODE
MC-16	411 109 1902	WASHER Y 3.1X6X0.5
MC-17	613 135 7686	CAM,MAIN
MC-18	613 135 7532	ASSY,RACK,LOAD
MC-19	411 109 1803	WASHER Y 2.6X6X0.5
MC-20	613 135 7648	SPACER,RACK LOAD
MC-22	411 047 6809	SCR PAN+FLG 3X4
MC-23	613 021 9763	ASSY,EARTH,CYL
MC-24	613 135 7662	GEAR,LOAD TAKE UP
MC-25	613 022 1551	SPRING,GEAR LOAD T
MC-26	613 021 9879	ASSY,LEVER,LOAD T
MC-27	613 090 6373	GEAR,LOAD S
MC-28	613 022 1704	SPRING,GEAR LOAD S
MC-29	613 021 9862	ASSY,LEVER,LOAD S
MC-30	613 022 2039	LEVER,RETURN TENSION
MC-31	613 091 3104	ASSY,LEVER CONTROL
MC-34	411 028 6309	SCR S-TPG PAN 2.6X6
MC-35	412 015 8603	SPECIAL WASHER 3.1X6X0.25
MC-36	613 130 9890	ASSY,GEAR,FRICTION
MC-37	412 045 4606	SPECIAL WASHER 2.4X6X0.25
MC-38	411 092 0906	WASHER Z 2.6X10X0.5
MC-40	411 100 0300	SCR S-TPG BIN 2.6X5
MC-41	613 120 9060	COMPL,MC-1

MECHANISM PARTS 2



MECHANISM PARTS 3



ELECTRICAL PARTS

NOTE;

1. Materials of Capacitors and Resistors are abbreviated as follows;

Resistors

MT-FILM	Metallized Film Resistor
MT-GLAZE	Metallized Glaze Resistor
OXIDE-MT	Oxide Metal Film Resistor

Capacitors

MT-POLYEST	Metallized Polyester Capacitor
MT-COMPO	Metallized Composite Capacitor
TA-SOLID	Tantalum Solid Capacitor
AL-SOLID	Aluminum Solid Capacitor
NP-ELECT	Non-Polarized Electrolytic Capacitor
OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
DL-ELECT	Double Layered Electrolytic Capacitor

2. Tolerance of Capacitor(10pF over) and Resistor are noted with follow symboles.
   F ····· ±1% G ····· ±2% J ····· ±5% K ····· ±10%
   M ····· ±20% N ····· ±30% Z ····· +80% ~ −20%
3. Capacitors
   U : uF P : pF
4. Inductors
   UH : uH MH : mH
5. N.S.P. : Not available as service parts.

LOCATION	PARTS NO.	DESCRIPTION
COMPL PWB,CP-1-A		
COMPL.NO	613 149 4435	
(SEMICONDUCTORS)		
Q1002	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1003	405 064 0100	TR 2SA1561-TL2-Q
OR	405 064 0209	TR 2SA1561-TL2-R
OR	405 123 6708	TR 2SB1320A-Q-(TA)
OR	405 123 6807	TR 2SB1320A-R-(TA)
Q1004	405 064 0100	TR 2SA1561-TL2-Q
OR	405 064 0209	TR 2SA1561-TL2-R
OR	405 123 6708	TR 2SB1320A-Q-(TA)
OR	405 123 6807	TR 2SB1320A-R-(TA)
Q1006	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1007	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1011	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q1012	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1013	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q1014	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1101	405 064 0100	TR 2SA1561-TL2-Q
OR	405 064 0209	TR 2SA1561-TL2-R
OR	405 123 6708	TR 2SB1320A-Q-(TA)
OR	405 123 6807	TR 2SB1320A-R-(TA)
Q1102	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1151	405 063 9906	TR DTC124EL-TL2
Q1151	405 123 6401	TR UN6212-(TA)
Q1152	405 064 0100	TR 2SA1561-TL2-Q
OR	405 064 0209	TR 2SA1561-TL2-R
OR	405 123 6708	TR 2SB1320A-Q-(TA)
OR	405 123 6807	TR 2SB1320A-R-(TA)
Q1301	405 063 9104	TR DTA144EL-TL2
OR	405 123 6609	TR UN6113-(TA)
Q1312	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1313	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q1601	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
Q1653	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q1654	405 064 0100	TR 2SA1561-TL2-Q
OR	405 064 0209	TR 2SA1561-TL2-R
OR	405 123 6708	TR 2SB1320A-Q-(TA)
OR	405 123 6807	TR 2SB1320A-R-(TA)
Q2001	405 024 9709	TR 2SD734-E-AA
OR	405 024 9907	TR 2SD734-F-AA
Q2002	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q2003	405 003 7702	TR 2SA1346-AC
OR	405 000 1208	TR DTA124ES-DCTP
Q3001	405 018 2808	TR 2SC3402-AC
OR	405 000 3103	TR DTC114ES-DCTP
Q3002	405 018 2808	TR 2SC3402-AC
OR	405 000 3103	TR DTC114ES-DCTP
Q3201	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q3202	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y

LOCATION	PARTS NO.	DESCRIPTION
Q3203	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q3503	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q3504	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q3553	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
OR	405 123 7002	TR 2SD1991A-Q-(TA)
OR	405 123 7101	TR 2SD1991A-R-(TA)
Q5101	405 088 9103	TR 2SA1703-S-AN
OR	405 108 7003	TR 2SB1322A-S(TA)
OR	405 108 6907	TR 2SB1322A-R(TA)
Q5102	405 089 2103	TR 2SC4483-S-AN
OR	405 107 4201	TR 2SD1994-S (TA)
OR	405 107 4102	TR 2SD1994-R (TA)
Q5103	405 018 2808	TR 2SC3402-AC
OR	405 000 3103	TR DTC114ES-DCTP
Q6001	405 026 9004	TR 2SK222-D-AA
OR	405 026 9103	TR 2SK222-E-AA
OR	405 114 7806	TR 2SK1104-(TA) P
OR	405 114 7905	TR 2SK1104-(TA) Q
OR	405 114 8001	TR 2SK1104-(TA) R
OR	405 073 6407	TR 2SK772-E-AC
OR	405 073 6506	TR 2SK772-F-AC
Q6002	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q6004	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6611	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q6621	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6901	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6902	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q6903	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6904	405 063 9708	TR DTC144EL-TL2
OR	405 123 6500	TR UN6213-(TA)
Q6921	405 084 8209	TR 2SC2960-F-SPA-AC
Q6921	405 084 8308	TR 2SC2960-G-SPA-AC
(INTEGRATED CIRCUITS)		
IC101	409 303 6700	IC LA7345M
IC111	409 297 6205	IC LC89925
IC161	409 003 4501	IC BA7021
OR	409 120 3401	IC LA7221
IC201	409 262 2409	IC LA7285M
IC301	410 169 6308	IC LC866648V-5356
OR	410 172 8900	IC LC866648V-5378
OR	410 174 4108	IC LC866648V-5389
OR	410 175 5906	IC LC866648V-5398
OR	410 177 2903	IC LC866648V-5407
IC302	409 114 4803	IC LB1641
IC303	409 243 4101	IC MN1380-L
IC321	410 166 2808	IC LC74760M-8783
IC351	409 306 0408	IC XRU2890BK
OR	409 306 0507	IC BU2890BK
OR	409 311 9601	IC BU2890DK
IC501	409 297 7509	IC STR-M6549
IC511	409 067 7203	IC L5431-AA
IC512	409 297 7400	IC PQ12SZ11
IC601	409 026 8203	IC L5631
OR	409 057 5103	IC UPC574J
IC602	409 247 7702	IC ST24C02AB1
OR	409 283 6202	IC LE24C02S1
OR	410 172 6807	IC X24C02P-C7189
(DIODES)		
D1003	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1004	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1007	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1301	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1601	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1602	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1611	407 070 7104	ZENER DIODE GZS5.6X-BT
OR	407 053 6704	ZENER DIODE MTZ5.6B-T-77
D1671	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3001	407 150 7703	DIODE RB441Q T-77
D3002	407 051 6904	ZENER DIODE GZS5.6Y-BT
OR	407 099 5303	ZENER DIODE MTZJ5.6B-T-77
D3003	407 070 8101	ZENER DIODE GZS8.2Y-BT
OR	407 063 9504	ZENER DIODE MTZJ8.2B-T-77
D3102	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3106	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3107	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3121	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3122	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3123	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3201	407 012 4406	DIODE 1SS133-T-77

LOCATION	PARTS NO.	DESCRIPTION
D3201	407 007 9904	DIODE GMA01-BT
D3202	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3502	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D5001	407 134 8900	DIODE DBC10G
D5003	407 091 6704	DIODE AP01C-V0
D5004	407 078 2705	DIODE 1SS244-T-77
D5011 ⚠	407 151 3308	PHOTO COUPLE PC120FB
D5101	407 129 2005	DIODE RL2Z-LF-B1
D5102	407 158 1505	DIODE ERC30-02L38
D5103	407 100 6909	DIODE AG01-V2
OR	407 091 6902	DIODE ERA38-04-V5
D5104	407 078 2705	DIODE 1SS244-T-77
D5105	407 100 6909	DIODE AG01-V2
OR	407 091 6902	DIODE ERA38-04-V5
D5109	407 099 5105	ZENER DIODE MTZJ4.7B-T-77
D5110	407 120 5807	DIODE AK04-V2
D5111	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D5112	407 063 8705	ZENER DIODE MTZJ5.1C-T-77
D5113	407 004 9709	DIODE DSK10C-BT
OR	407 005 8701	DIODE ERA15-02-V5
D5114	407 078 2705	DIODE 1SS244-T-77
D6601	407 070 7104	ZENER DIODE GZS5.6X-BT
OR	407 053 6704	ZENER DIODE MTZ5.6B-T-77
D6901	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6902	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6903	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
(CRYSTAL DEVICES)		
X1001	645 000 6012	OSC,CRYSTAL 4.433619MHZ
OR	645 000 6029	OSC,CRYSTAL 4.433619MHZ
OR	645 002 4436	OSC,CRYSTAL 4.433619MHZ
X3001	613 132 8242	RESONATOR,CERAMIC13.92MHZ
X3002	613 109 0972	OSC,CRYSTAL 32KHZ
OR	613 123 6387	OSC,CRYSTAL 32.768KHZ
X3201	613 002 8709	CRYSTAL 17.734475MHZ
OR	613 127 1555	OSC,CRYSTAL 17.734475MHZ
(VARIABLE RESISTORS)		
VR101	613 120 8438	VR,SEMI 22KB
OR	613 120 8582	VR,SEMI 22KB
VR102	613 120 8421	VR,SEMI 2.2KB
OR	613 120 8575	VR,SEMI 2.2KB
VR103	613 120 8506	VR,SEMI 4.7KB
OR	613 120 8650	VR,SEMI 4.7KB
VR104	613 079 2532	VR,SEMI 10KB
OR	613 120 8544	VR,SEMI 10KB
VR201	613 097 7915	VR,SEMI 100KB
OR	613 001 9097	SEMI VR 100KB
VR351	613 097 7953	VR,SEMI 220KB
OR	613 001 9110	SEMI VR 220KB
(TRIMMER)		
CT321	613 002 6378	TRIMMER
(INDUCTORS)		
L1001	613 014 1156	COIL,INDUCTOR 39UHJ
OR	613 014 4676	HF CHOKE 39UHJ

LOCATION	PARTS NO.	DESCRIPTION
L1002	613 014 0739	COIL,INDUCTOR 1.0UHM
OR	613 014 4256	HF CHOKE 1.0UHK
L1004	613 014 0999	COIL,INDUCTOR 150UHK
OR	613 014 4515	HF CHOKE 150UHK
L1005	613 014 1019	COIL,INDUCTOR 220UHK
OR	613 014 4539	HF CHOKE 220UHK
L1007	613 014 0791	COIL,INDUCTOR 3.3UHK
OR	613 014 4317	HF CHOKE 3.3UHK
L1008	613 014 0876	COIL,INDUCTOR 15UHK
OR	613 014 4393	HF CHOKE 15UHK
L1009	613 014 0777	COIL,INDUCTOR 2.2UHM
OR	613 014 4294	HF CHOKE 2.2UHK
L1010	613 014 0906	COIL,INDUCTOR 27UHK
OR	613 014 4423	HF CHOKE 27UHK
L1012	613 014 1156	COIL,INDUCTOR 39UHJ
OR	613 014 4676	HF CHOKE 39UHJ
L1013	613 014 0913	COIL,INDUCTOR 33UHK
OR	613 014 4430	HF CHOKE 33UHK
L1081	613 014 0975	COIL,INDUCTOR 100UHK
OR	613 014 4492	HF CHOKE 100UHK
L1101	613 014 0968	COIL,INDUCTOR 82UHK
OR	613 014 4485	HF CHOKE 82UHK
L2002	613 014 3532	HF CHOKE 10000UHJ
L2003	613 015 6297	COIL,INDUCTOR 560UHJ
L3201	613 014 1057	COIL,INDUCTOR 5.6UHJ
OR	613 014 4577	HF CHOKE 5.6UHJ
L5002 ⚠	613 140 6438	COIL,LINE FILTER
OR ⚠	645 002 1886	LINE FILTER
L5003	613 107 6884	FERRITE CORE
L5101	613 110 4198	COIL,INDUCTOR 10UH K
OR	645 002 4122	INDUCTOR 10U K
L5102	613 145 4262	COIL,INDUCTOR 22UH K
OR	645 002 4962	INDUCTOR 22U K
L6004	613 014 0852	COIL,INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UHK
L6601	613 014 0739	COIL,INDUCTOR 1.0UHM
OR	613 014 4256	HF CHOKE 1.0UHK
L6603	613 014 0852	COIL,INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UHK
L6621	613 014 0944	COIL,INDUCTOR 56UHK
OR	613 014 4461	HF CHOKE 56UHK
(TRANSFORMERS)		
T2001	613 094 3378	TRANS,OSC 70KHZ
OR	613 016 2205	OSC COIL 70KHZ
T5001 ⚠	645 000 9730	TRANS,POWER,PULSE
T6901	613 109 0958	TRANS,IF
OR	613 109 0965	TRANS,IF
(DELAY LINES)		
DL101	645 000 5992	DELAY LINE(COMB)
OR	645 000 6005	DELAY LINE(COMB)
(CAPACITORS)		
C1001	403 017 9705	CERAMIC 22P J 50V
C1002	403 071 5408	CERAMIC 220P J 50V
C1003	403 030 6309	CERAMIC 68P J 50V
C1004	403 022 7703	CERAMIC 33P J 50V
C1005	403 139 2608	ELECT 0.47U M 50V
C1006	403 025 7304	CERAMIC 4.7P K 50V
C1007	403 073 2702	CERAMIC 390P J 50V
C1008	403 017 9705	CERAMIC 22P J 50V
C1009	403 025 7304	CERAMIC 4.7P K 50V

LOCATION	PARTS NO.	DESCRIPTION			
C1010	403 075 3103	CERAMIC	82P	J	50V
C1011	403 139 2707	ELECT	1U	M	50V
C1012	403 139 1502	ELECT	10U	M	16V
C1013	403 139 2608	ELECT	0.47U	M	50V
C1014	403 001 1906	CERAMIC	0.01U	M	16V
C1015	403 120 9005	CERAMIC	0.022U	J	16V
C1016	403 120 9005	CERAMIC	0.022U	J	16V
C1021	403 073 2702	CERAMIC	390P	J	50V
C1022	403 217 5507	CERAMIC	0.1U	J	16V
C1023	403 030 6309	CERAMIC	68P	J	50V
C1027	403 001 1906	CERAMIC	0.01U	M	16V
C1029	403 139 1502	ELECT	10U	M	16V
C1030	403 191 8709	ELECT	1U	M	50V
C1031	403 191 8709	ELECT	1U	M	50V
C1032	403 120 9609	CERAMIC	0.047U	J	16V
C1033	403 120 9005	CERAMIC	0.022U	J	16V
C1034	403 075 2601	CERAMIC	75P	J	50V
C1036	403 191 8709	ELECT	1U	M	50V
C1037	403 191 8808	ELECT	2.2U	M	50V
C1038	403 120 9005	CERAMIC	0.022U	J	16V
C1039	403 120 9609	CERAMIC	0.047U	J	16V
C1040	403 001 1906	CERAMIC	0.01U	M	16V
C1041	403 189 2405	ELECT	10U	M	16V
C1042	403 120 9609	CERAMIC	0.047U	J	16V
C1043	403 222 1105	CERAMIC	0.047U	Z	16V
C1044	403 163 7907	ELECT	47U	M	6.3V
C1045	403 001 1906	CERAMIC	0.01U	M	16V
C1046	403 139 1502	ELECT	10U	M	16V
C1047	403 139 1502	ELECT	10U	M	16V
C1048	403 001 1906	CERAMIC	0.01U	M	16V
C1049	403 022 7703	CERAMIC	33P	J	50V
C1050	403 001 1906	CERAMIC	0.01U	M	16V
C1051	403 073 6205	CERAMIC	470P	J	50V
C1052	403 001 1906	CERAMIC	0.01U	M	16V
C1053	403 001 1906	CERAMIC	0.01U	M	16V
C1054	403 139 1007	ELECT	47U	M	6.3V
C1058	403 019 9703	CERAMIC	27P	J	50V
C1060	403 022 7703	CERAMIC	33P	J	50V
C1061	403 022 7703	CERAMIC	33P	J	50V
C1062	403 071 1509	CERAMIC	180P	J	50V
C1081	403 074 8703	CERAMIC	680P	J	50V
C1092	403 068 9402	CERAMIC	100P	K	50V
C1101	403 139 1007	ELECT	47U	M	6.3V
C1102	403 001 1906	CERAMIC	0.01U	M	16V
C1105	403 026 2209	CERAMIC	47P	J	50V
C1106	403 025 7304	CERAMIC	4.7P	K	50V
C1107	403 026 2209	CERAMIC	47P	J	50V
C1109	403 001 1906	CERAMIC	0.01U	M	16V
C1110	403 139 2707	ELECT	1U	M	50V
C1311	403 120 9005	CERAMIC	0.022U	J	16V
C1601	403 121 9509	CERAMIC	0.1U	Z	50V
C1602	403 223 9308	ELECT	470U	M	6.3V
C1611	403 193 8608	ELECT	0.47U	M	50V
C1613	403 121 9509	CERAMIC	0.1U	Z	50V
C1614	403 139 1502	ELECT	10U	M	16V
C2002	403 075 4506	CERAMIC	820P	K	50V
C2004	403 139 0901	ELECT	33U	M	6.3V
C2005	403 150 0201	CERAMIC	0.018U	K	16V
C2009	403 150 6500	ELECT	22U	M	16V
C2010	403 139 1809	ELECT	47U	M	16V
C2013	403 002 8201	CERAMIC	0.015U	J	25V
C2016	403 191 8600	ELECT	4.7U	M	25V
C2017	403 139 1502	ELECT	10U	M	16V
C2019	403 139 1809	ELECT	47U	M	16V
C2020	403 071 6207	CERAMIC	220P	K	50V
C2021	403 081 7409	POLYPRO	0.033U	J	100V
C2022	403 129 0409	CERAMIC	0.01U	K	16V
C2024	403 129 0409	CERAMIC	0.01U	K	16V

LOCATION	PARTS NO.	DESCRIPTION			
C2071	403 001 3306	CERAMIC	1200P	M	16V
C2072	403 191 8808	ELECT	2.2U	M	50V
C2073	403 003 4707	CERAMIC	0.027U	J	25V
C2091	403 121 9509	CERAMIC	0.1U	Z	50V
C2092	403 001 5102	CERAMIC	2200P	M	16V
C2101	403 121 9509	CERAMIC	0.1U	Z	50V
C2102	403 121 9509	CERAMIC	0.1U	Z	50V
C2152	403 069 1207	CERAMIC	1000P	K	50V
C2153	403 001 8905	CERAMIC	6800P	M	16V
C3001	403 191 8808	ELECT	2.2U	M	50V
C3002	403 001 1906	CERAMIC	0.01U	M	16V
C3003	403 121 9509	CERAMIC	0.1U	Z	50V
C3004	403 001 1906	CERAMIC	0.01U	M	16V
C3005	403 001 1906	CERAMIC	0.01U	M	16V
C3008	403 189 2405	ELECT	10U	M	16V
C3009	403 001 1906	CERAMIC	0.01U	M	16V
C3010	403 009 1700	CERAMIC	10P	J	50V
C3011	403 017 0108	CERAMIC	20P	J	50V
C3012	403 001 1906	CERAMIC	0.01U	M	16V
C3013	403 001 1906	CERAMIC	0.01U	M	16V
C3016	403 001 1906	CERAMIC	0.01U	M	16V
C3017	403 223 9308	ELECT	470U	M	6.3V
C3020	403 069 1207	CERAMIC	1000P	K	50V
C3021	403 026 2209	CERAMIC	47P	J	50V
C3022	403 265 4408	DL-ELECT	0.1F	Z	5.5V
C3023	403 010 7708	CERAMIC	12P	J	50V
C3201	403 012 6006	CERAMIC	15P	J	50V
C3202	403 012 6006	CERAMIC	15P	J	50V
C3203	403 139 2707	ELECT	1U	M	50V
C3204	403 009 1700	CERAMIC	10P	J	50V
C3205	403 019 0403	CERAM	24P	J	50V
C3206	403 138 2500	CERAMIC	0.022U	K	16V
C3207	403 119 7104	CERAMIC	6800P	K	16V
C3208	403 086 2805	NP-ELECT	1U	M	50V
C3211	403 191 8709	ELECT	1U	M	50V
C3212	403 068 9402	CERAMIC	100P	K	50V
C3213	403 163 7907	ELECT	47U	M	6.3V
C3214	403 189 2405	ELECT	10U	M	16V
C3216	403 139 1007	ELECT	47U	M	6.3V
C3217	403 001 1906	CERAMIC	0.01U	M	16V
C3501	403 129 9709	CERAMIC	0.015U	K	16V
C3502	403 001 8806	CERAMIC	6800P	K	16V
C3503	403 129 9709	CERAMIC	0.015U	K	16V
C3505	403 150 6500	ELECT	22U	M	16V
C3506	403 001 8806	CERAMIC	6800P	K	16V
C3508	403 150 6500	ELECT	22U	M	16V
C3511	403 071 6207	CERAMIC	220P	K	50V
C3512	403 184 9201	MT-POLYEST	0.039U	J	50V
C3513	403 119 6701	CERAMIC	0.068U	K	16V
C3514	403 057 2902	POLYESTER	0.1U	K	50V
C3515	403 059 6007	POLYESTER	0.022U	K	50V
C3516	403 001 5003	CERAMIC	2200P	K	16V
C3517	403 001 3801	CERAMIC	1500P	K	16V
C3522	403 069 1207	CERAMIC	1000P	K	50V
C3523	403 191 8709	ELECT	1U	M	50V
C3524	403 001 1906	CERAMIC	0.01U	M	16V
C3525	403 193 8608	ELECT	0.47U	M	50V
C3526	403 138 2500	CERAMIC	0.022U	K	16V
C3530	403 163 7907	ELECT	47U	M	6.3V
C3536	403 193 7601	ELECT	220U	M	6.3V
C3540	403 068 9402	CERAMIC	100P	K	50V
C3551	403 175 0903	MT-POLYEST	0.12U	J	50V
C3552	403 028 3402	CERAMIC	56P	J	50V
C3553	403 191 8709	ELECT	1U	M	50V
C3554	403 070 7205	CERAMIC	150P	J	50V
C3556	403 069 1207	CERAMIC	1000P	K	50V
C3558	403 149 0700	ELECT	33U	M	16V

LOCATION	PARTS NO.	DESCRIPTION
C5001 ⚠	404 055 4905	MT-POLYEST 0.068U M 250V
C5002 ⚠	404 055 4905	MT-POLYEST 0.068U M 250V
C5003	403 238 1809	ELECT 47U M 400V
C5004	403 243 9203	ELECT 2.2U M 250V
C5005	403 255 8409	CERAMIC 39P J 1K
C5006	403 157 0105	ELECT 10U M 35V
C5020 ⚠	404 032 8506	CERAMIC 1000P M 400V
C5022 ⚠	404 032 8506	CERAMIC 1000P M 400V
C5101	403 204 6401	ELECT 1000U M 16V
C5102	403 148 0305	ELECT 470U M 16V
C5104	403 243 8909	ELECT 1000U M 10V
C5105	403 147 9507	ELECT 470U M 6.3V
C5106	403 154 8302	ELECT 47U M 50V
C5107	403 155 3009	ELECT 47U M 25V
C5108	403 155 5409	ELECT 220U M 6.3V
C5110	403 184 9300	MT-POLYEST 0.047U J 50V
C5111	403 121 9509	CERAMIC 0.1U Z 50V
C5112	403 126 4509	ELECT 100U M 16V
C5113	403 001 1906	CERAMIC 0.01U M 16V
C5114	403 135 4002	ELECT 47U M 6.3V
C6001	403 121 9509	CERAMIC 0.1U Z 50V
C6004	403 168 6103	MT-POLYEST 0.1U J 50V
C6006	403 248 1608	ELECT 47U M 16V
C6007	403 222 1105	CERAMIC 0.047U Z 16V
C6009	403 193 8905	ELECT 22U M 50V
C6010	403 121 9509	CERAMIC 0.1U Z 50V
C6017	403 073 7004	CERAMIC 470P K 50V
C6601	403 189 2405	ELECT 10U M 16V
C6602	403 189 2405	ELECT 10U M 16V
C6611	403 150 6500	ELECT 22U M 16V
C6621	403 022 7703	CERAMIC 33P J 50V
C6622	403 022 7703	CERAMIC 33P J 50V
C6901	403 121 9509	CERAMIC 0.1U Z 50V
C6902	403 189 2405	ELECT 10U M 16V
C6903	403 003 3700	CERAMIC 0.022U Z 25V
C6904	403 258 3807	ELECT 0.22U M 50V
C6921	403 121 9509	CERAMIC 0.1U Z 50V
C6924	403 168 6202	MT-POLYEST 0.33U J 50V
C6925	403 184 9805	MT-POLYEST 0.22U J 50V
C6926	403 233 0302	ELECT 100U M 16V
C6927	403 071 2001	CERAMIC 180P K 50V

(RESISTORS)

R1001	401 018 3708	CARBON 3.3K JA 1/4W
R1002	401 013 5202	CARBON 1.2K JA 1/4W
R1003	401 019 1802	CARBON 3.9K JA 1/4W
R1004	401 012 5609	CARBON 1K JA 1/4W
R1005	401 019 0904	CARBON 390 JA 1/4W
R1006	401 023 1607	CARBON 820 JA 1/4W
R1007	401 012 5609	CARBON 1K JA 1/4W
R1008	401 017 1705	CARBON 2.7K JA 1/4W
R1009	401 022 1806	CARBON 680 JA 1/4W
R1010	401 016 3700	CARBON 2.2K JA 1/4W
R1012	401 012 5609	CARBON 1K JA 1/4W
R1013	401 012 5609	CARBON 1K JA 1/4W
R1014	401 016 3700	CARBON 2.2K JA 1/4W
R1018	401 012 5609	CARBON 1K JA 1/4W
R1019	401 016 4707	CARBON 22K JA 1/4W
R1020	401 016 4707	CARBON 22K JA 1/4W
R1021	401 012 5609	CARBON 1K JA 1/4W
R1022	401 012 5609	CARBON 1K JA 1/4W
R1023	401 022 1806	CARBON 680 JA 1/4W
R1026	401 012 9201	CARBON 1M JA 1/4W
R1027	401 023 2703	CARBON 8.2K JA 1/4W
R1028	401 015 2605	CARBON 1.8K JA 1/4W
R1029	401 012 5609	CARBON 1K JA 1/4W
R1032	401 016 4707	CARBON 22K JA 1/4W
R1033	401 012 5609	CARBON 1K JA 1/4W
R1035	401 020 0702	CARBON 470 JA 1/4W
R1036	401 014 4006	CARBON 1.5K JA 1/4W
R1038	401 012 5609	CARBON 1K JA 1/4W
R1040	401 014 2804	CARBON 150 JA 1/4W
R1044	401 013 6308	CARBON 12K JA 1/4W
R1046	401 018 4804	CARBON 33K JA 1/4W
R1047	401 023 2703	CARBON 8.2K JA 1/4W
R1048	401 020 1907	CARBON 4.7K JA 1/4W
R1049	401 013 6308	CARBON 12K JA 1/4W
R1052	401 012 5609	CARBON 1K JA 1/4W
R1053	401 018 2701	CARBON 330 JA 1/4W
R1054	401 018 3708	CARBON 3.3K JA 1/4W
R1058	401 021 2903	CARBON 5.6K JA 1/4W
R1059	401 015 2605	CARBON 1.8K JA 1/4W
R1063	401 016 4707	CARBON 22K JA 1/4W
R1071	401 017 1705	CARBON 2.7K JA 1/4W
R1072	401 015 2605	CARBON 1.8K JA 1/4W
R1104	401 021 1807	CARBON 560 JA 1/4W
R1105	401 012 5609	CARBON 1K JA 1/4W
R1106	401 012 5609	CARBON 1K JA 1/4W
R1107	401 016 3700	CARBON 2.2K JA 1/4W
R1153	401 020 1907	CARBON 4.7K JA 1/4W
R1154	401 020 1907	CARBON 4.7K JA 1/4W
R1601	401 021 1807	CARBON 560 JA 1/4W
R1602	401 022 6702	CARBON 75 JA 1/4W
R1603	401 015 0403	CARBON 18 JA 1/4W
R1611	401 012 5609	CARBON 1K JA 1/4W
R1614	401 012 5609	CARBON 1K JA 1/4W
R1615	401 022 6702	CARBON 75 JA 1/4W
R1651	401 023 2703	CARBON 8.2K JA 1/4W
R1652	401 013 6308	CARBON 12K JA 1/4W
R1653	401 021 0602	CARBON 56 JA 1/4W
R1656	401 012 6903	CARBON 10K JA 1/4W
R1657	401 021 2903	CARBON 5.6K JA 1/4W
R1658	401 021 2903	CARBON 5.6K JA 1/4W
R1659	401 012 6903	CARBON 10K JA 1/4W
R1671	401 012 4404	CARBON 100 JA 1/4W
R1673	401 012 6903	CARBON 10K JA 1/4W
R2001	401 012 4404	CARBON 100 JA 1/4W
R2002	401 017 1705	CARBON 2.7K JA 1/4W
R2003	401 020 7404	CARBON 51 JA 1/4W
R2004	401 019 3905	CARBON 390K JA 1/4W
R2005	401 021 8905	CARBON 6.2K JA 1/4W
R2009	401 012 9201	CARBON 1M JA 1/4W
R2010	401 012 6903	CARBON 10K JA 1/4W
R2011	401 014 5102	CARBON 15K JA 1/4W
R2012	401 018 4804	CARBON 33K JA 1/4W
R2013	401 022 3008	CARBON 6.8K JA 1/4W
R2014	401 013 5202	CARBON 1.2K JA 1/4W
R2018	401 016 4707	CARBON 22K JA 1/4W
R2021	401 017 6106	CARBON 3.3 JA 1/4W
R2022	401 019 9501	CARBON 47 JA 1/4W
R2023	401 014 5102	CARBON 15K JA 1/4W
R2024	401 019 6104	CARBON 4.7 JA 1/4W
R2071	401 022 0700	CARBON 68 JA 1/4W
R2091	401 017 1705	CARBON 2.7K JA 1/4W
R2101	401 019 2908	CARBON 39K JA 1/4W
R2102	401 017 2702	CARBON 27K JA 1/4W
R2103	401 019 2908	CARBON 39K JA 1/4W
R2104	401 016 4707	CARBON 22K JA 1/4W
R2105	401 020 7800	CARBON 510 JA 1/4W
R2106	401 023 1607	CARBON 820 JA 1/4W
R2107	401 021 1807	CARBON 560 JA 1/4W
R2108	401 017 1705	CARBON 2.7K JA 1/4W
R2109	401 017 1705	CARBON 2.7K JA 1/4W
R2110	401 012 5609	CARBON 1K JA 1/4W
R2111	401 022 7105	CARBON 750 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R3001 ⚠	402 067 7402	FUSIBLE RES 3.3 JA 1/2W
R3002	401 022 7105	CARBON 750 JA 1/4W
R3004	401 014 4006	CARBON 1.5K JA 1/4W
R3008	401 020 1907	CARBON 4.7K JA 1/4W
R3009	401 020 1907	CARBON 4.7K JA 1/4W
R3010	401 020 1907	CARBON 4.7K JA 1/4W
R3011	401 020 2805	CARBON 47K JA 1/4W
R3012	401 020 1907	CARBON 4.7K JA 1/4W
R3013	401 020 1907	CARBON 4.7K JA 1/4W
R3014	401 016 0402	CARBON 200K JA 1/4W
R3015	401 016 0402	CARBON 200K JA 1/4W
R3018	401 012 6903	CARBON 10K JA 1/4W
R3020	401 012 6903	CARBON 10K JA 1/4W
R3022	401 012 8006	CARBON 100K JA 1/4W
R3023	401 012 5609	CARBON 1K JA 1/4W
R3024	401 012 5609	CARBON 1K JA 1/4W
R3025	401 012 5609	CARBON 1K JA 1/4W
R3026	401 012 5609	CARBON 1K JA 1/4W
R3032	401 018 4804	CARBON 33K JA 1/4W
R3034	401 013 6308	CARBON 12K JA 1/4W
R3035	401 012 6903	CARBON 10K JA 1/4W
R3036	401 012 6903	CARBON 10K JA 1/4W
R3045	401 020 1907	CARBON 4.7K JA 1/4W
R3061	401 020 2805	CARBON 47K JA 1/4W
R3062	401 018 4804	CARBON 33K JA 1/4W
R3101	401 012 8006	CARBON 100K JA 1/4W
R3102	401 012 8006	CARBON 100K JA 1/4W
R3103	401 012 8006	CARBON 100K JA 1/4W
R3104	401 012 8006	CARBON 100K JA 1/4W
R3201	401 012 5609	CARBON 1K JA 1/4W
R3202	401 014 4006	CARBON 1.5K JA 1/4W
R3203	401 022 3008	CARBON 6.8K JA 1/4W
R3204	401 016 3700	CARBON 2.2K JA 1/4W
R3205	401 014 4006	CARBON 1.5K JA 1/4W
R3206	401 012 4404	CARBON 100 JA 1/4W
R3207	401 012 6903	CARBON 10K JA 1/4W
R3208	401 016 2505	CARBON 220 JA 1/4W
R3209	401 012 8006	CARBON 100K JA 1/4W
R3210	401 022 3008	CARBON 6.8K JA 1/4W
R3211	401 016 4707	CARBON 22K JA 1/4W
R3212	401 019 7705	CARBON 4.3K JA 1/4W
R3213	401 012 5609	CARBON 1K JA 1/4W
R3501	401 012 8006	CARBON 100K JA 1/4W
R3502	401 012 8006	CARBON 100K JA 1/4W
R3503	401 018 5702	CARBON 330K JA 1/4W
R3504	401 014 6000	CARBON 150K JA 1/4W
R3505	401 014 5102	CARBON 15K JA 1/4W
R3506	401 016 5704	CARBON 220K JA 1/4W
R3507	401 014 6000	CARBON 150K JA 1/4W
R3508	401 017 2702	CARBON 27K JA 1/4W
R3516	401 012 6903	CARBON 10K JA 1/4W
R3517	401 020 2805	CARBON 47K JA 1/4W
R3518	401 020 2805	CARBON 47K JA 1/4W
R3520	401 018 5702	CARBON 330K JA 1/4W
R3521	401 012 6903	CARBON 10K JA 1/4W
R3525	401 012 5609	CARBON 1K JA 1/4W
R3526	401 016 3700	CARBON 2.2K JA 1/4W
R3527	401 012 5609	CARBON 1K JA 1/4W
R3528	401 020 7800	CARBON 510 JA 1/4W
R3529	401 020 7800	CARBON 510 JA 1/4W
R3533	401 014 4006	CARBON 1.5K JA 1/4W
R3537	401 023 2703	CARBON 8.2K JA 1/4W
R3546	401 020 1907	CARBON 4.7K JA 1/4W
R3547	401 014 5102	CARBON 15K JA 1/4W
R3549	401 012 6903	CARBON 10K JA 1/4W
R3550	401 023 2703	CARBON 8.2K JA 1/4W
R3556	401 012 6903	CARBON 10K JA 1/4W
R3557	401 018 5702	CARBON 330K JA 1/4W
R3558	401 020 0702	CARBON 470 JA 1/4W
R3560	401 012 5609	CARBON 1K JA 1/4W
R5001 ⚠	402 064 1502	CARBON 2.7M KA 1/2W
R5003	401 069 4402	OXIDE-MT 68K JA 2W
R5005	401 090 0404	CARBON 680K JA 1/2W
R5006	401 090 0404	CARBON 680K JA 1/2W
R5009	401 012 3308	CARBON 10 JA 1/4W
R5010	401 057 5107	OXIDE-MT 0.47 JA 1W
R5105	401 107 5200	MT-FILM 560 FD 1/4W
R5106	401 107 5309	MT-FILM 620 FD 1/4W
R5107	401 019 7200	CARBON 430 JA 1/4W
R5108	401 012 5609	CARBON 1K JA 1/4W
R5109	401 021 8905	CARBON 6.2K JA 1/4W
R5110	401 016 3700	CARBON 2.2K JA 1/4W
R5111	401 012 5609	CARBON 1K JA 1/4W
R5112	401 013 6308	CARBON 12K JA 1/4W
R5113	401 016 7401	CARBON 240 JA 1/4W
R5114	401 016 7401	CARBON 240 JA 1/4W
R5115	401 106 9704	MT-FILM 82 FD 1/4W
R5117	401 016 7401	CARBON 240 JA 1/4W
R5118	401 016 7401	CARBON 240 JA 1/4W
R5120 ⚠	402 068 0808	FUSIBLE RES 3.9 JA 1/4W
R6001	401 018 2701	CARBON 330 JA 1/4W
R6002	401 019 0904	CARBON 390 JA 1/4W
R6003	401 012 9201	CARBON 1M JA 1/4W
R6004	401 019 3905	CARBON 390K JA 1/4W
R6005	401 020 3802	CARBON 470K JA 1/4W
R6006	401 019 3905	CARBON 390K JA 1/4W
R6007	401 017 3709	CARBON 270K JA 1/4W
R6008	401 012 5609	CARBON 1K JA 1/4W
R6010	401 012 8006	CARBON 100K JA 1/4W
R6011	401 012 8006	CARBON 100K JA 1/4W
R6611	401 013 9408	CARBON 1.3K JA 1/4W
R6612	401 015 2605	CARBON 1.8K JA 1/4W
R6613	401 021 1807	CARBON 560 JA 1/4W
R6621	401 021 2903	CARBON 5.6K JA 1/4W
R6622	401 012 5609	CARBON 1K JA 1/4W
R6623	401 023 1607	CARBON 820 JA 1/4W
R6624	401 015 2605	CARBON 1.8K JA 1/4W
R6901	401 012 5609	CARBON 1K JA 1/4W
R6902	401 018 2701	CARBON 330 JA 1/4W
R6903	401 021 8103	CARBON 620 JA 1/4W
R6904	401 012 6903	CARBON 10K JA 1/4W
R6905	401 018 5702	CARBON 330K JA 1/4W
R6906	401 012 6903	CARBON 10K JA 1/4W
R6907	401 018 3708	CARBON 3.3K JA 1/4W
R6908	401 023 0600	CARBON 82 JA 1/4W
R6909	401 012 5609	CARBON 1K JA 1/4W
R6910	401 020 7800	CARBON 510 JA 1/4W
R6911	401 021 2903	CARBON 5.6K JA 1/4W
R6912	401 019 1802	CARBON 3.9K JA 1/4W
R6923	401 012 6903	CARBON 10K JA 1/4W
R6924	401 012 6903	CARBON 10K JA 1/4W
R6925	401 015 3701	CARBON 18K JA 1/4W
R6926	401 014 5102	CARBON 15K JA 1/4W
R6927	401 013 6308	CARBON 12K JA 1/4W
R6928	401 012 4404	CARBON 100 JA 1/4W
R6929	401 018 4804	CARBON 33K JA 1/4W
(SWITCHES)		
S3101	645 000 3363	SWITCH,PUSH,REW
OR	613 139 4308	SW,PUSH,REW
S3102	645 000 3363	SWITCH,PUSH,PLAY
OR	613 139 4308	SW,PUSH,PLAY
S3103	645 000 3363	SWITCH,PUSH,REC
OR	613 139 4308	SW,PUSH,REC
S3104	645 000 3363	SWITCH,PUSH,EJECT

LOCATION	PARTS NO.	DESCRIPTION
S3104	613 139 4308	SW,PUSH,EJECT
S3105	645 000 3363	SWITCH,PUSH,FF
OR	613 139 4308	SW,PUSH,FF
S3106	645 000 3363	SWITCH,PUSH,STOP
OR	613 139 4308	SW,PUSH,STOP
S3107	645 000 3363	SWITCH,PUSH,PAUSE
OR	613 139 4308	SW,PUSH,PAUSE
S3108	645 000 3363	SWITCH,PUSH,POWER
OR	613 139 4308	SW,PUSH,POWER
S3117	645 000 3363	SWITCH,PUSH,CH+
OR	613 139 4308	SW,PUSH,CH+
S3118	645 000 3363	SWITCH,PUSH,CH-
OR	613 139 4308	SW,PUSH,CH-
(FUSE)		
F5001 ⚠	423 022 6506	FUSE 250V 2.5A
(PROTECTOR)		
PR511 ⚠	613 138 8871	CIRCUIT PROTECTOR
(CONNECTORS)		
CN161	613 111 5712	SOCKET,21P
OR	645 002 4528	SOCKET,RGB 21P
CN501 ⚠	645 000 5411	SOCKET,INLET AC
(MISCELLANEOUS)		
	613 053 8055	FIXER
	613 136 4554	HOLDER,FUSE,F5001

****

COMPL PWB,VP-1
COMPL.NO 613 144 7738

(SEMICONDUCTORS)		
Q1801	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
OR	405 035 6100	TR 2SC2413K-T96-Q
Q1851	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
OR	405 035 6100	TR 2SC2413K-T96-Q
Q1852	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
OR	405 035 6100	TR 2SC2413K-T96-Q
(INTEGRATED CIRCUIT)		
IC181	409 302 2802	IC LA7377A
(VARIABLE RESISTORS)		
VR182	613 117 1718	VR,SEMI 2.2KB
OR	613 002 0369	SEMI VR 2.2KXB
(INDUCTORS)		
L1801	613 014 0968	COIL,INDUCTOR 82UHK
OR	613 014 4485	HF CHOKE 82UHK
L1802	613 014 0951	COIL,INDUCTOR 68UHK
OR	613 014 4478	HF CHOKE 68UHK
L1851	613 014 0821	COIL,INDUCTOR 5.6UHK
OR	613 014 4348	HF CHOKE 5.6UHK
L1852	613 014 0944	COIL,INDUCTOR 56UHK
OR	613 014 4461	HF CHOKE 56UHK
L1853	613 014 0876	COIL,INDUCTOR 15UHK
OR	613 014 4393	HF CHOKE 15UHK
L1854	613 014 0876	COIL,INDUCTOR 15UHK
OR	613 014 4393	HF CHOKE 15UHK

LOCATION	PARTS NO.	DESCRIPTION
(CAPACITORS)		
C1801	403 154 3307	OS-SOLID 4.7U M 10V
C1804	403 069 5601	CERAMIC 0.01U K 50V
C1805	403 193 8509	ELECT 0.33U M 50V
C1807	403 026 7600	CERAMIC 470P J 50V
C1808	403 034 6800	CERAMIC 91P J 50V
C1809	403 069 5601	CERAMIC 0.01U K 50V
C1810	403 069 5601	CERAMIC 0.01U K 50V
C1811	403 069 5601	CERAMIC 0.01U K 50V
C1812	403 069 5601	CERAMIC 0.01U K 50V
C1813	403 073 1200	CERAMIC 0.033U K 50V
C1814	403 073 1200	CERAMIC 0.033U K 50V
C1851	403 069 5601	CERAMIC 0.01U K 50V
C1852	403 022 8304	CERAMIC 33P J 50V
C1853	403 022 8304	CERAMIC 33P J 50V
C1854	403 026 2902	CERAMIC 47P J 50V
C1855	403 028 4201	CERAMIC 56P J 50V
C1861	403 069 5601	CERAMIC 0.01U K 50V
C1862	403 163 7907	ELECT 47U M 6.3V
(RESISTORS)		
R1801	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1803	401 037 5608	MT-GLAZE 10K JA 1/10W
R1805	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R1807	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1808	401 038 1302	MT-GLAZE 2.4K JA 1/10W
R1810	401 037 5400	MT-GLAZE 1K JA 1/10W
R1811	401 038 7205	MT-GLAZE 5.1K JA 1/10W
R1813	401 037 5400	MT-GLAZE 1K JA 1/10W
R1814	401 038 0800	MT-GLAZE 22K JA 1/10W
R1815	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R1816	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1851	401 037 5400	MT-GLAZE 1K JA 1/10W
R1852	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1853	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1854	401 038 5003	MT-GLAZE 390 JA 1/10W
R1855	401 038 5003	MT-GLAZE 390 JA 1/10W
R1856	401 039 0304	MT-GLAZE 820 JA 1/10W
R1857	401 039 0304	MT-GLAZE 820 JA 1/10W
R1858	401 039 0304	MT-GLAZE 820 JA 1/10W
R1859	401 038 7601	MT-GLAZE 560 JA 1/10W
R1860	401 038 2002	MT-GLAZE 270 JA 1/10W
(JUMPERS)		
J1863	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J1886	401 037 5004	MT-GLAZE 0.000 ZA 1/10W

****

COMPL PWB,TM-1
COMPL.NO 613 144 4461

(REMOTE RECEIVERS)		
RR711	613 129 0938	IR RECEIVER PACK UNIT
OR	613 134 9087	IR RECEIVER PACK UNIT
(DISPLAYS)		
A7101	613 140 4007	FLUORESCENT TUBE
OR	613 140 4014	FLUORESCENT TUBE
(MISCELLANEOUS)		
	613 139 2267	HOLDER FL

****

LOCATION	PARTS NO.	DESCRIPTION
COMPL PCB,MC-1		
COMPL.NO	613 120 9060	
(DIODES)		
D8001	407 094 1300	PHOTO COUPLE SPI-315-04-C
OR	407 043 0101	PHOTO DIODE ON2170-R
(RESISTORS)		
R8001	401 026 0607	CARBON 270 JA 1/6W
OR	401 017 0708	CARBON 270 JA 1/4W
R8002	401 024 6700	CARBON 100 JA 1/6W
OR	401 012 4404	CARBON 100 JA 1/4W
(SWITCH)		
S8001	613 022 4545	SPECIAL SWITCH

****

FLEXIBLE FLAT CABLE

	613 144 4577	FLEXIBLE FLAT CABLES CN303-CN811
	613 145 8475	FLEXIBLE FLAT CABLES CN101-CN181

****

Parts No. TP30033

Parts number for Mechanical Service Manual TP30036

THORN EMI UK Rental Limited
The Park Centre, Arlington Business Park,
Theale, Reading, Berkshire RG7 4SA

June/'93/160 NS Printed in Japan

SM 531230

VR182LV

BLOCK DIAGRAMS,CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS

TABLE OF CONTENTS

Page

1. OVERALL WIRING, MECHANISM CONNECTION, & BLOCK DIAGRAMS

OVERALL WIRING 1
MECHANISM CONNECTION 3
VIDEO CIRCUIT 4
SYSTEM CONTROL & SERVO CIRCUIT 7
AUDIO CIRCUIT 10

2. CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS (P.W.B.)

CP-1 P.W.B. 11
CP-1 BOARD (PW-A) POWER SUPPLY 13
CP-1 BOARD (AD-A) AUDIO 14
CP-1 BOARD (VD-A) VIDEO 16
VIDEO CIRCUIT WAVEFORMS 18
VP-1 BOARD VIDEO PRE-AMP 19
CP-1 BOARD (CV-A) RF CONVERTER CONNECTION 19
VP-1 P.W.B. 20
CP-1 BOARD (TN-A) TUNER IF CONNECTION 20
IC301 SYSTEM CONTROL,TIMER, & TUNING CONTROL MPU PIN FUNCTIONS TABLE 22
CP-1 BOARD (SY-A) SYSTEM CONTROL 23
CP-1 BOARD (SV-A) SERVO 25
SERVO CIRCUIT WAVEFORMS 27
ON SCREEN (IC321) WAVEFORMS 27
TM-1 BOARD DISPLAY (FLD) 28
TM-1 P.W.B. 28
A7101 DISPLAY (FLD) GRID/ANODE ASSIGNMENT DRAWING & TABLE 28

NOTES:

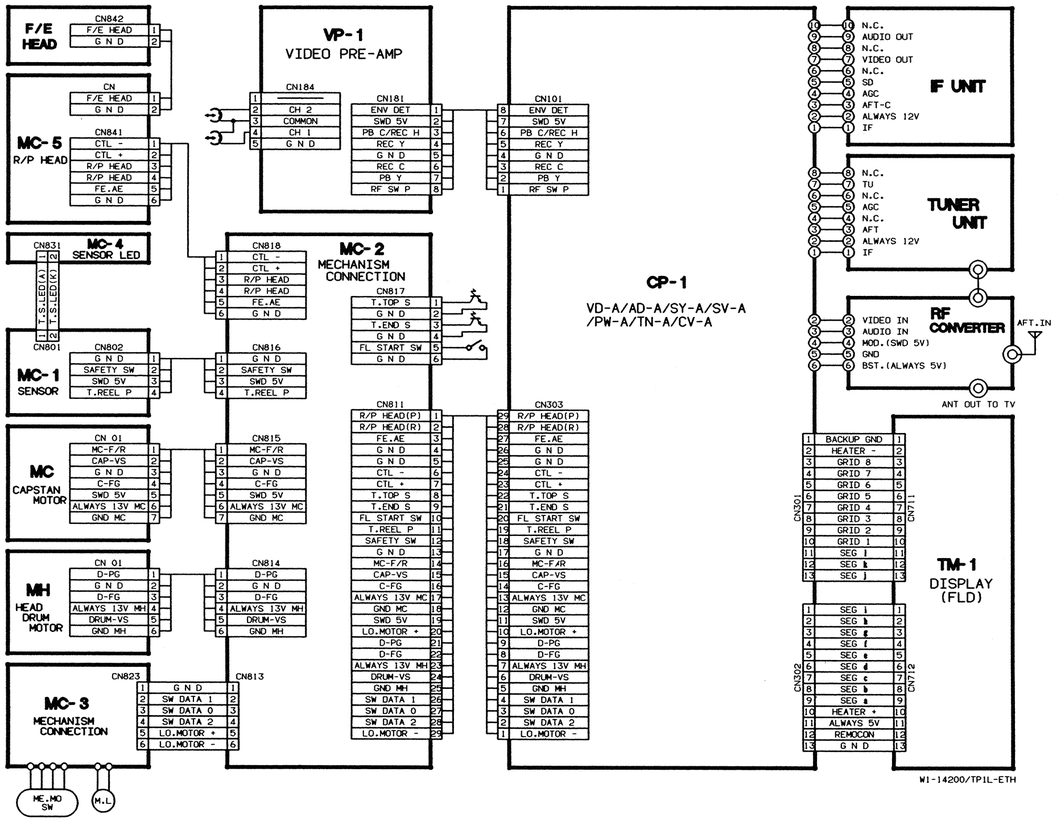
1. All resistance values in "OHMS" unless otherwise noted. (K=1,000 M=1,000,000)
2. All capacitance values in "μfd" unless otherwise noted. p=pico farad
3. All inductance values in "mH" unless otherwise noted. μ=micro henry

PRODUCT SAFETY NOTICE

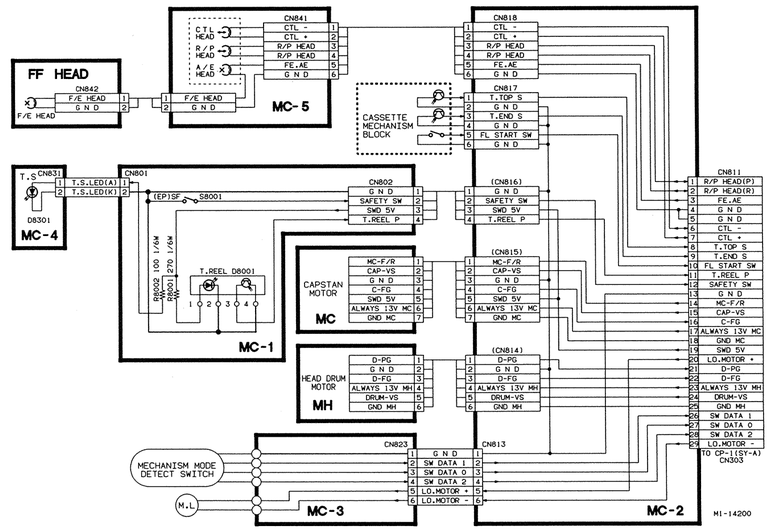
THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SIMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

1. OVERALL WIRING, MECHANISM CONNECTION, & BLOCK DIAGRAMS

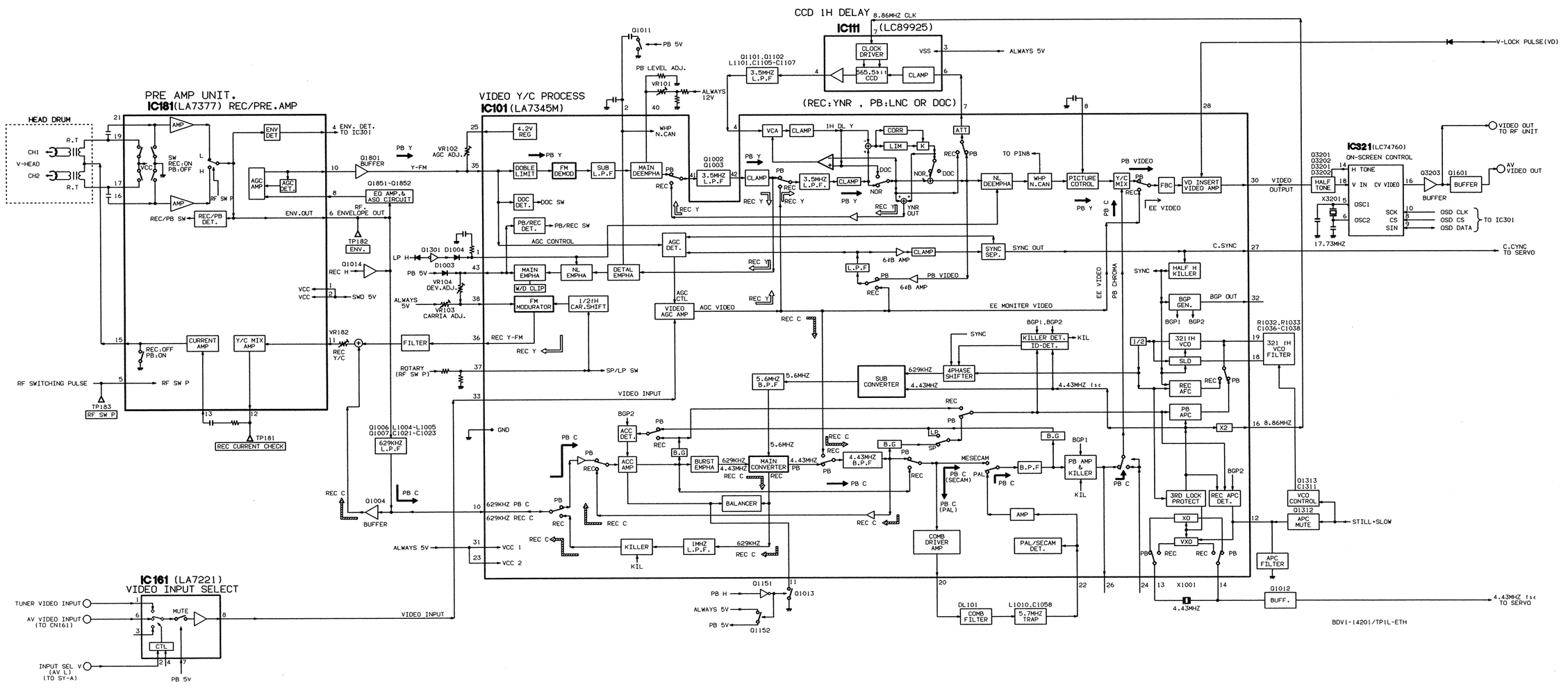
OVERALL WIRING



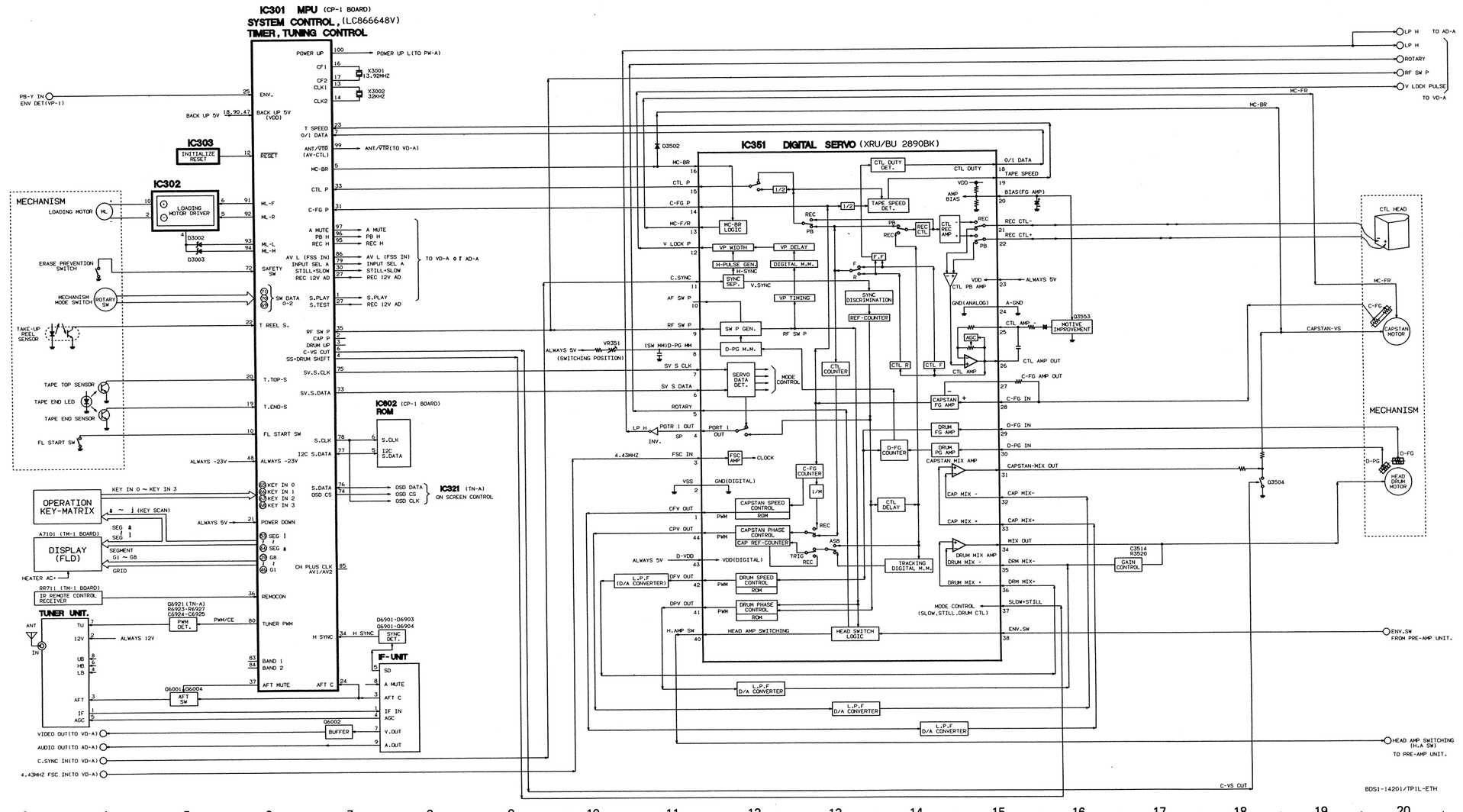
MECHANISM CONNECTION



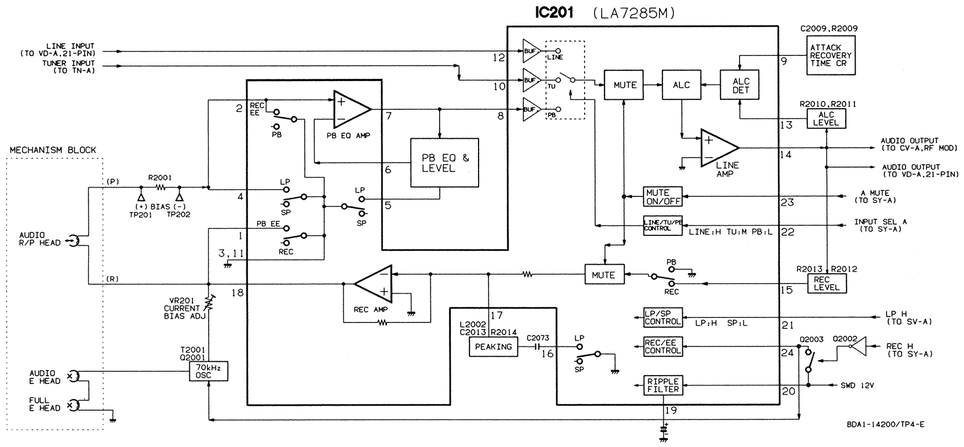
VIDEO CIRCUIT



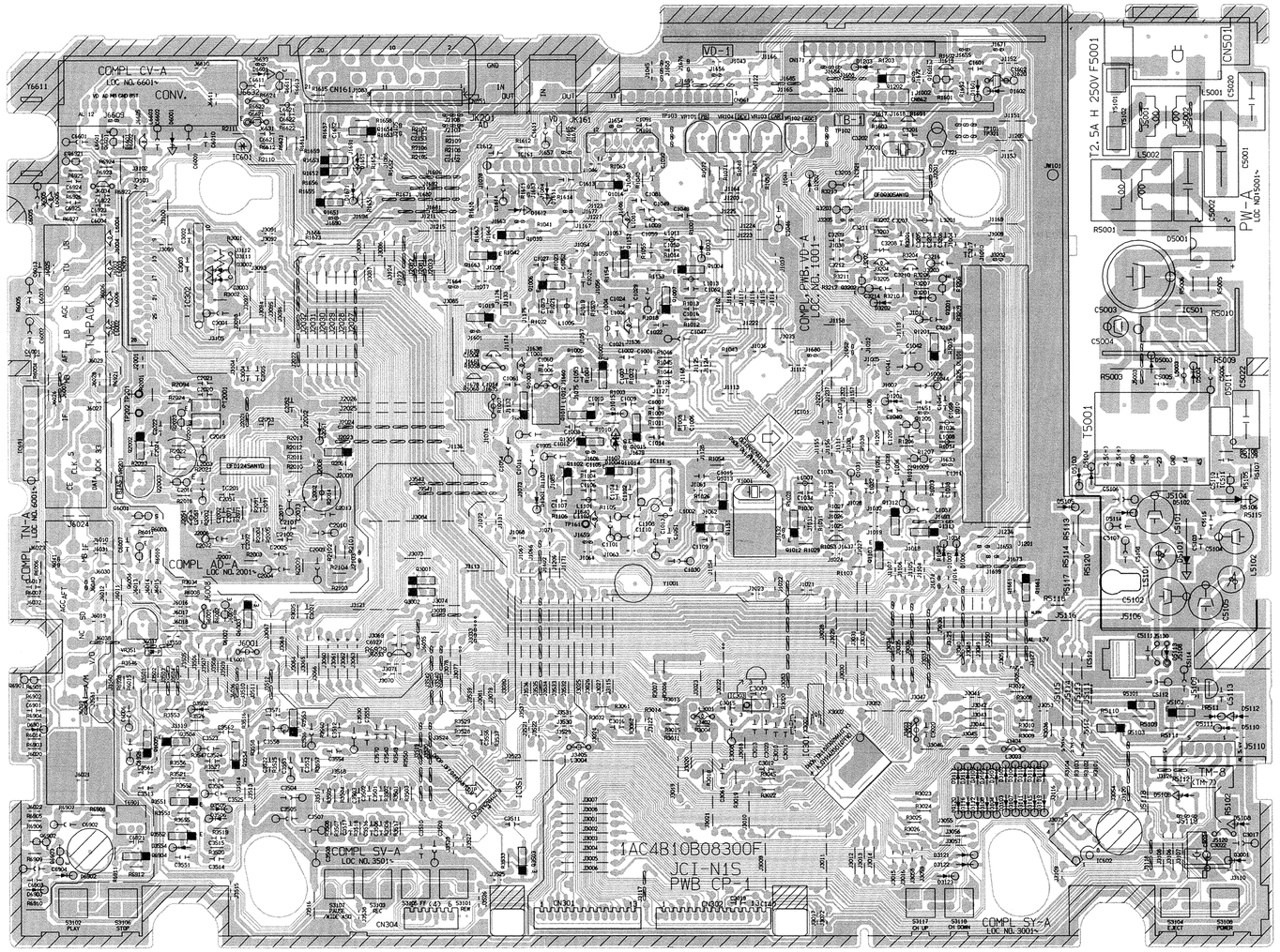
SYSTEM CONTROL & SERVO CIRCUIT



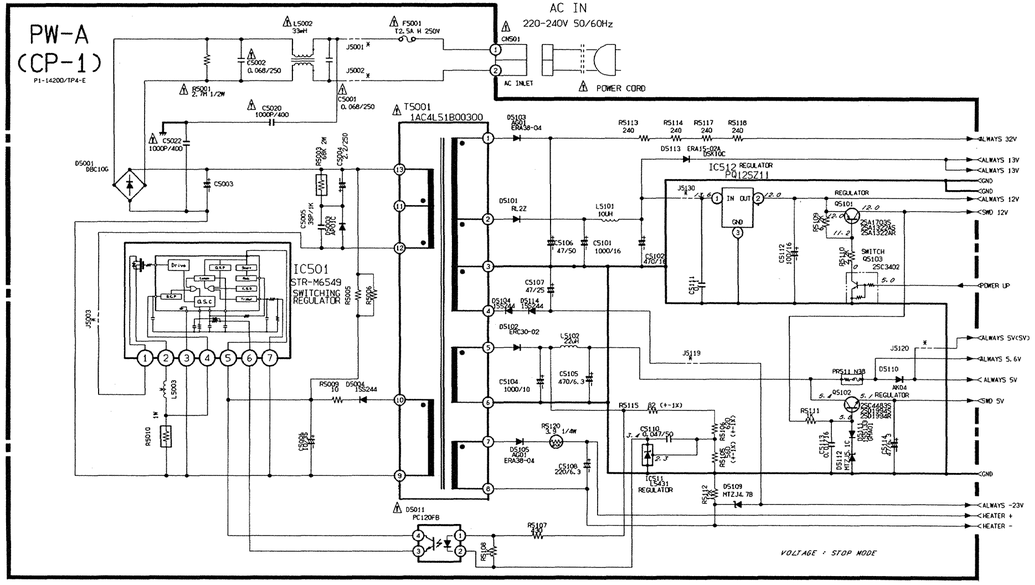
AUDIO CIRCUIT



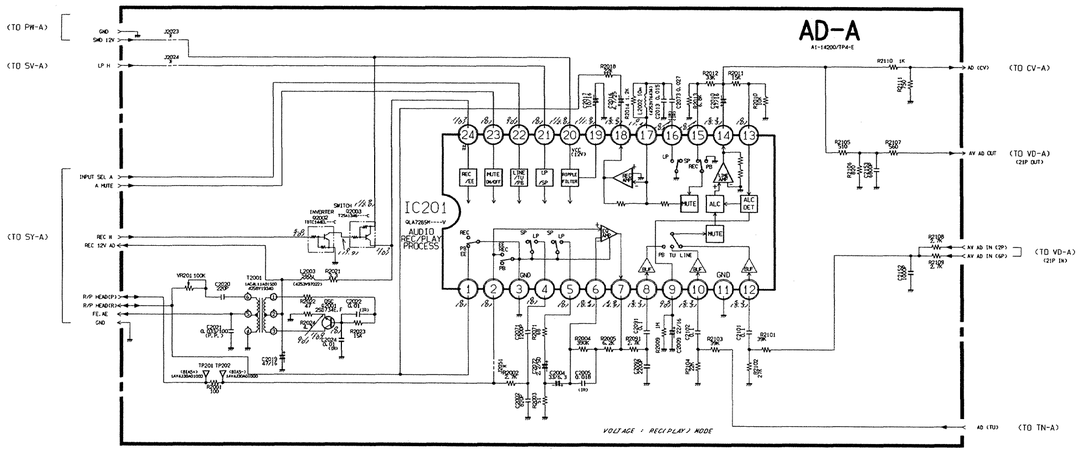
CP-1 P.W.B.



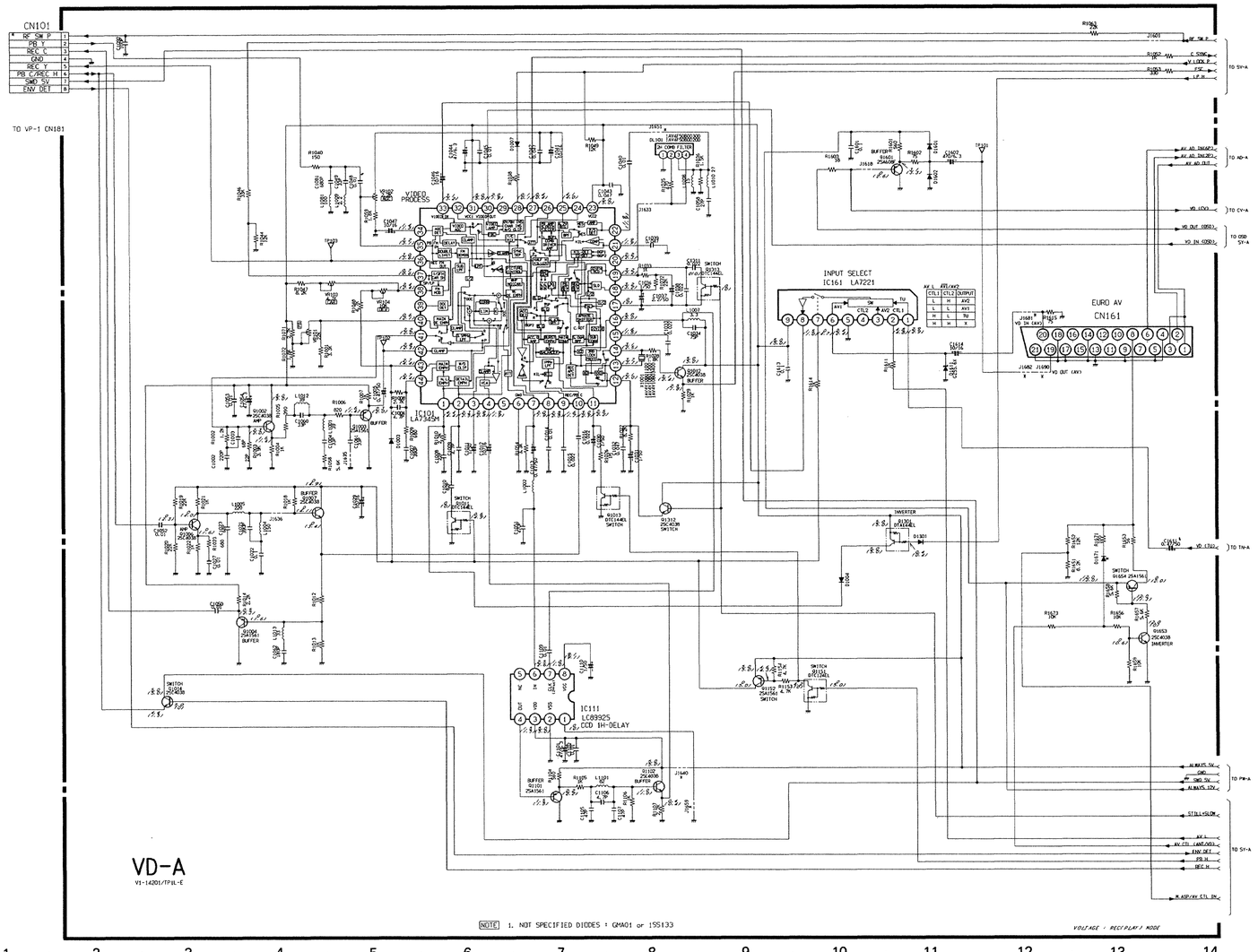
CP-1 BOARD (PW-A) POWER SUPPLY



CP-1 BOARD (AD-A) AUDIO



CP-1 BOARD (VD-A) VIDEO

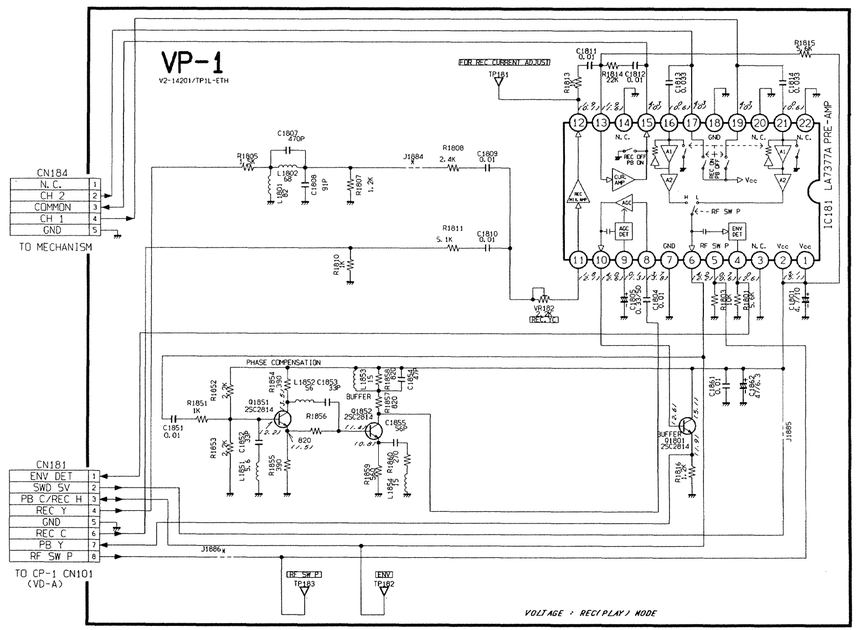


VIDEO CIRCUIT WAVEFORMS

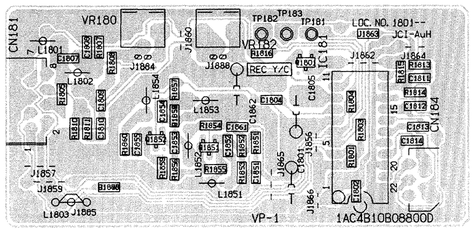
WF-V-TP

TEST LOCATION	WAVEFORM	MODE/LEVEL	TEST LOCATION	WAVEFORM	MODE/LEVEL
IC101 Pin 33 (VIDEO IN)		REC, EE 1 Vp-p	IC101 Pin 30 (VIDEO OUT)		PB 2.5 Vp-p
IC101 Pin 41		REC, EE 0.6 Vp-p	IC101 Pin 30 (VIDEO OUT)		REC, EE 2 Vp-p
IC101 Pin 42		REC, EE 0.5 Vp-p	IC101 (UPPER) Pin 30 (LOWER) Pin 28		STILL (UPPER) 2 Vp-p (LOWER) 5 Vp-p
IC101 Pin 43		REC, EE 1.2 Vp-p	IC101 Pin 10 (REC CHROMA OUT)		REC, EE 0.4 Vp-p
IC101 Pin 36 (REC FM OUT)		REC, EE 1.0 Vp-p	Q1006 Base (PB CHROMA)		PB 0.3 Vp-p
IC101 Pin 35 (PB FM IN)		PB 0.3 Vp-p	Q1007 Emitter (PB CHROMA)		PB 0.2 Vp-p
IC101 Pin 41		PB 0.5 Vp-p	IC101 Pin 10 (PB CHROMA IN)		PB 0.2 Vp-p
IC101 Pin 42		PB 0.5 Vp-p	IC101 Pin 20		PB 1.0 Vp-p
IC101 Pin 7/4		PB 0.3 Vp-p	IC101 Pin 26		PB 0.6 Vp-p

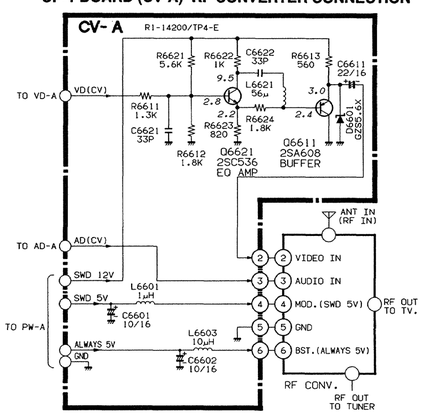
VP-1 BOARD VIDEO PRE-AMP



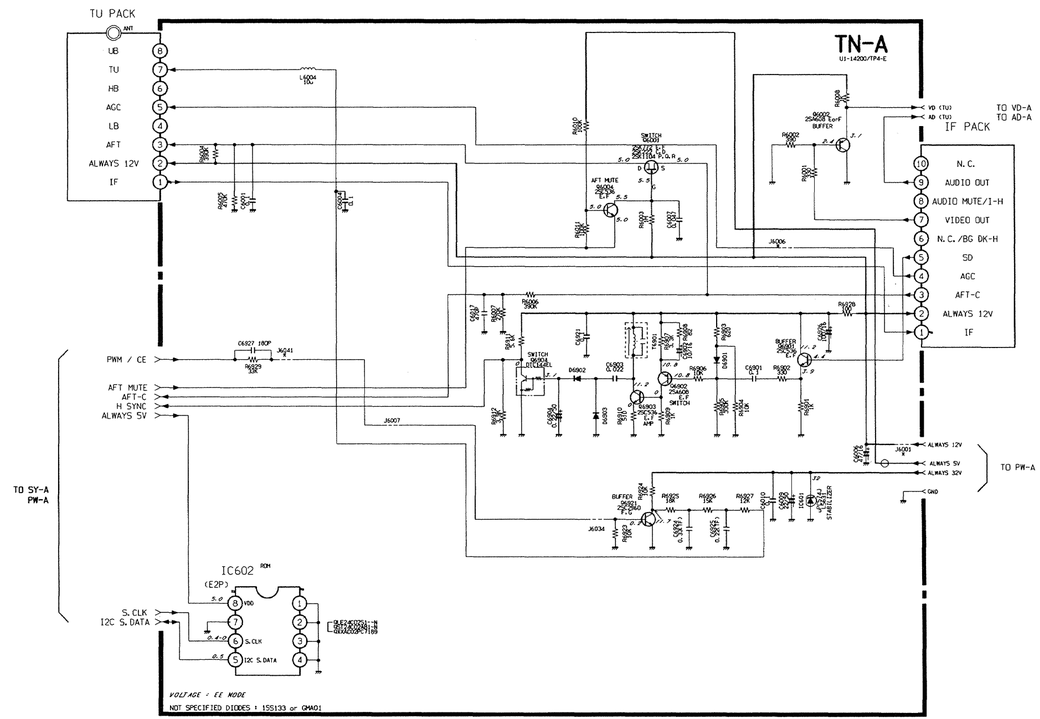
VP-1 P.W.B.



CP-1 BOARD (CV-A) RF CONVERTER CONNECTION



CP-1 BOARD (TN-A) TUNER IF CONNECTION



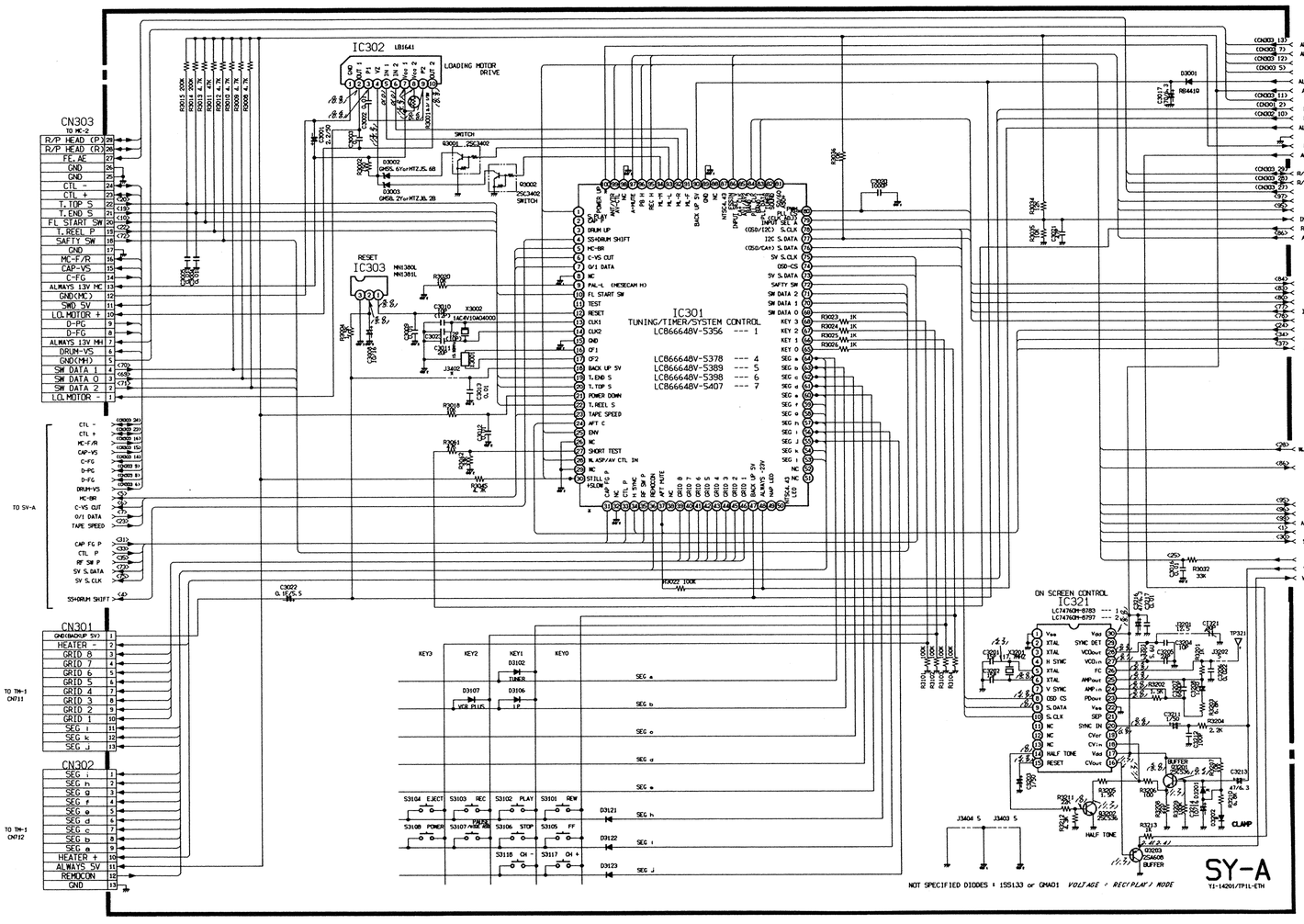
IC301 SYSTEM CONTROL, TIMER, & TUNING CONTROL MPU PIN FUNCTIONS TABLE

No.	Name	I/O	I/O Signal Function
1	S - PLAY	O	Signal for indicating CUE , REV , STILL and SLOW modes.
2	CAP P.	O	Gain down control for Head Motor Amplifier at SLOW mode.
3	DRUM UP	O	Head drum motor rotation speed up signal.
4	SS + DRUM SHIFT	O	Signal for indicating SLOW/STILL modes and alternation of drum motor control data. (3 value voltage)
5	MC - BR	O	Brake signal for capstan motor.
6	C - Vs CUT	O	Cut off for capstan motor control voltage in SLOW / STILL modes.
7	0 / 1 DATA	I	CTL pulse duty detection signal input. Used for VISS detection.
8	-	-	-
9	PAL L	O	PAL mode indication signal output.
10	FL- START SW	I	Switch input indicating start of cassette loading or discharge by cassette mechanism.
11	-	-	-
12	RESET	I	Initial reset terminal for this IC.
13	XT1	-	Clock OSC during power failures.
14	XT2	-	Frequency is 32.672kHz.
15	VSS	-	Ground terminal
16	CF1	-	IC clock OSC terminal.
17	CF2	-	Frequency is 13.92MHz.
18	VDD	-	IC power supply terminal.(5Vdc)
19	T. END S.	I	Sensor signal input for tape end detection.
20	T. TOP S.	I	Sensor signal input for tape beginning detection.
21	POWER DOWN	I	Power failure detection terminal.
22	T. REEL P.	I	Pulse input for detection of take-up reel table rotation.
23	TAPE SPEED	I	Input of result of tape speed discrimination by digital servo IC.
24	AFT- C	I	Tuner AFT s-curve signal input for tuner AFT control.
25	ENV.	I	Video head envelope detection signal input for ATR function.
26	-	-	-
27	SHORT TEST	I	REC mode indication signal input (REC 12V).
28	W. ASP/ AV CTL IN	I	AV source selection signal input from AV terminal.
29	-	-	-
30	STILL + SLOW	O	STILL or SLOW modes indication signal output.
31	C - FG P.	I	FG signal input of capstan motor.
32	-	-	-
33	CTL P.	I	CTL head recording / playback pulse signal input.
34	H SYNC	I	Sync. signal input for existing channel discrimination and TV system discrimination.
35	RF SW P.	I	Input of RF switching pulse created by head drum PG.
36	REMOCON	I	Remote control signal input.
37	AFT MUTE	O	"H" output during TU AFT mute. (V-syn model only)
38	-	-	-
39	G8	O	Display grid outputs (FLD).
40	G7	O	
41	G6	O	
42	G5	O	
43	G4	O	
44	G3	O	
45	G2	O	
46	G1	O	
47	VDD	-	IC power supply input.(5Vdc)
48	V LOAD	O	-30V input for FLD drive.
49	NAP LED	O	Signal for NAP indicator LED drive.
50	NTSC 4.43 LED	O	Signal for NTSC4.43 indicator LED drive.
51	-	-	-
52	-	-	-
53	SEG l	O	Display segment outputs (FLD). (Includes key-scan output)
54	SEG k	O	

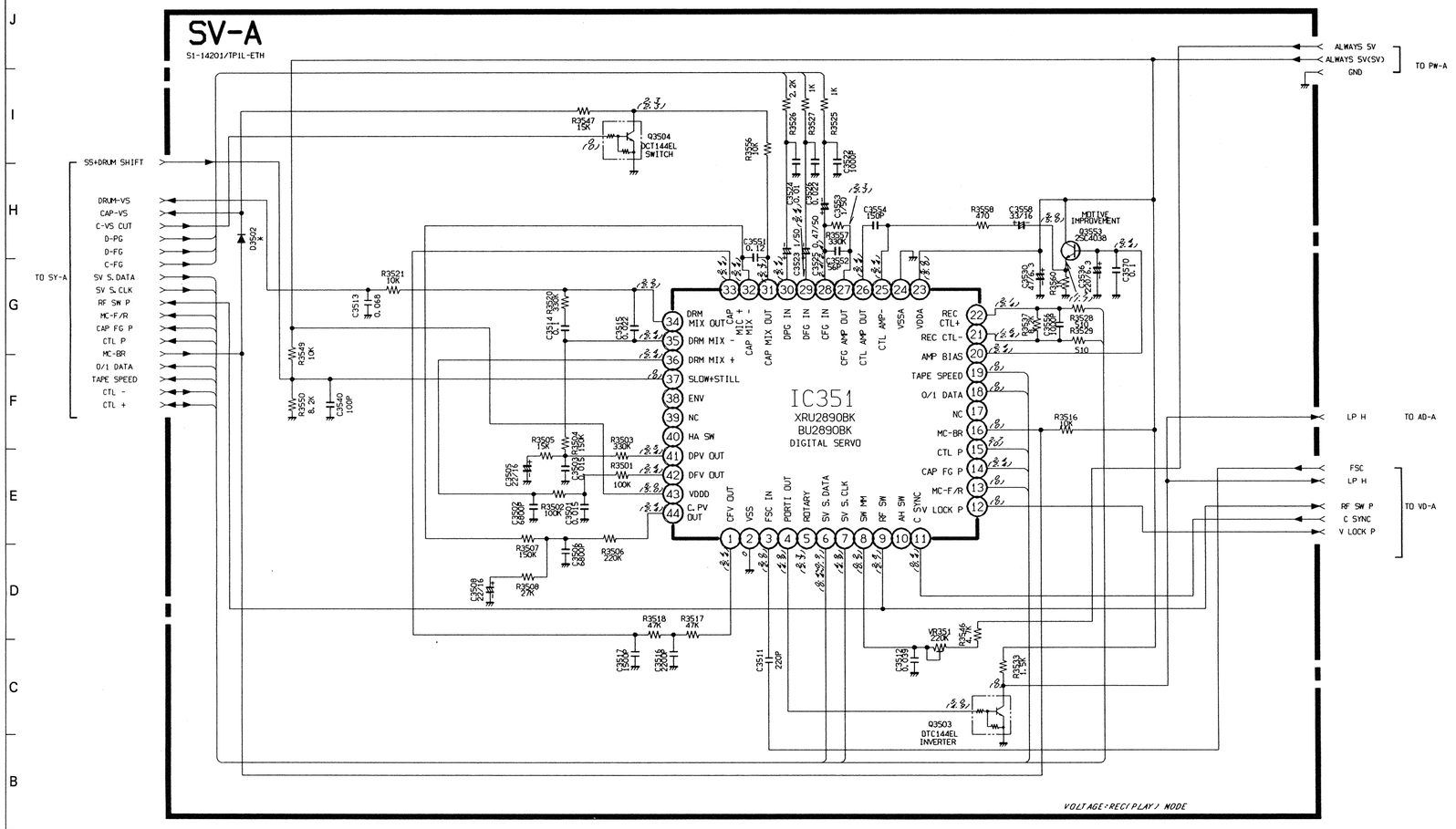
No.	Name	I/O	I/O Signal Function
55	SEG j	O	Display segment outputs (FLD). (Includes key-scan output)
56	SEG i	O	
57	SEG h	O	
58	SEG g	O	
59	SEG f	O	
60	SEG e	O	
61	SEG d	O	
62	SEG c	O	
63	SEG b	O	
64	SEG a	O	
65	KEY IN 0	I	Operation key data inputs.
66	KEY IN 1	I	
67	KEY IN 2	I	
68	KEY IN 3	I	
69	SW DATA 0	I	3-bit data indicating operation position of mechanism.
70	SW DATA 1	I	
71	SW DATA 2	I	
72	SAFETY SW	I	Terminal for accidental erasure prevention switch. No operation to recording mode while "LOW" is input.
73	SV S. DATA	O	Output 8-bit X 4 serial data giving operation mode and tracking data,etc., to digital servo IC.
74	OSD CS	O	Chip enable (access) signal output to OSD IC.
75	SV S. CLK	O	The clock pulse for digital servo IC.
76	S. DATA (OSD/CH+)	I/O	Terminal for communication of respective data with OSD IC and CH+ control IC.
77	I2C SDA	I/O	Data exchange with tuning memory IC and VPS IC.
78	S. CLK (OSD/I2C)	O	The clock pulse for OSD IC and tuning memory IC.
79	INPUT SEL A	O	Signal for selecting audio input source.
80	PLL CS	O	Chip enable signal output to tuner PLL tuning system IC. (F-syn model)
	PWM	O	Tuning voltage output (PWM signal). (V-syn model)
81	50 / 60	O	* LOW * output during NAP or NTSC4.43 modes. (60 field mode)
82	TUNER SOUND	O	TV system indication signal output (PAL I or DK).
83	BAND 1	O	Tuning band data(BAND 1 and 2 ; for V-syn model).
	PLL DATA	O	Data exchange with tuner PLL IC (for F-syn model).
84	BAND 2	O	BAND 1 and 2 ; (L,L)=VHF-LOW (L,H)=VHF-HIGH (H,L)=UHF (H,H)=SKIP. (for V-syn model)
	PLL CLK	O	The clock for PLL IC of tuner unit (for F-syn model).
85	CH+ CLK	O	The clock for CH+ input/output source selection IC.
	AV1 / AV2	O	Signal for selecting AV-input (video/audio) source.
86	INPUT SEL V	O	Signal for selecting video input source.
	FSS IN	I	CH+ mode control signal input (CH+ model).
87	NTSC 4.43	O	* H * output during NTSC 4.43 playback mode.
88	-	-	-
89	VSS	-	IC ground terminal.
90	VDD	-	IC power supply input.(5Vdc)
91	ML- F	O	Loading motor rotation direction (FWD) indication signal.
92	ML- R	O	Loading motor rotation direction (REV) indication signal.
93	ML- L	O	Loading motor rotation speed (low speed) indication signal.
94	ML- M	O	Loading motor rotation speed (medium speed) indication signal.
95	REC H	O	Signal for indicating recording mode.
96	PB H	O	Signal for indicating playback mode.
97	A MUTE	O	"H" output for disable audio output signal.
98	-	-	-
99	AV CTL	O	AV terminal (pin8 of 21pins AV socket) control signal output.
	ANT / VTR	O	Selection the RF source of ANTENNA or VTR.
100	POWER UP	O	"HIGH" output except when power is off. Indicating that power is ON.

TP4VF_UF

CP-1 BOARD (SY-A) SYSTEM CONTROL



CP-1 BOARD (SV-A) SERVO



SERVO CIRCUIT WAVEFORMS (IC351:XRU2890 Series)

TEST LOCATION	WAVEFORM & MODE/LEVEL	TEST LOCATION	WAVEFORM & MODE/LEVEL
Pin 40 (H.A.SWITCHING)	SLOW PB 5.0V 20msec 20msec	Pin 15 (CTL PULSE)	REC 5.0V 24msec 16msec
Pin 42 (PWM)	5.0V 8.66KHz	Pin 15 (CTL PULSE)	PB 850µsec 5.0V 40msec
Pin 41, 44, 1 (PWM)	5.0V 69.27KHz	Pin 21 (CTL HEAD–)	REC 3.6V 1.4V 24msec 16msec
Pin 3 (FSC INPUT)	0.3Vp-p 4.43MHz	Pin 22 (CTL HEAD+)	REC 1.4V 3.6V 24msec 16msec
Pin 5 (ROTARY)	PB 5.0V 20msec 20msec	Pin 26 (CTL AMP OUT)	PB 2Vp-p 40msec
Pin 8 (D-PG MM)	2msec 2.5V 7msec	Pin 28 (C-FG INPUT)	10mVp-p 0.66msec
Pin 9 (RF SW PULSE)	5.0V 20msec 20msec	Pin 29 (D-FG INPUT)	30mVp-p 1.33msec
Pin 10 (AF SW PULSE)	PB 5.0V 20msec 20msec	Pin 30 (D-PG INPUT)	250mVp-p 40msec
Pin 11 (COMPOSITE SYNC INPUT)	T=20msec 4.2V	Pin 38 (ENV.SW INPUT)	SLOW PB 4.0V 20msec 20msec
Pin 14 (C-FG PULSE)	5.0V 1513Hz		

WF-S-TP4

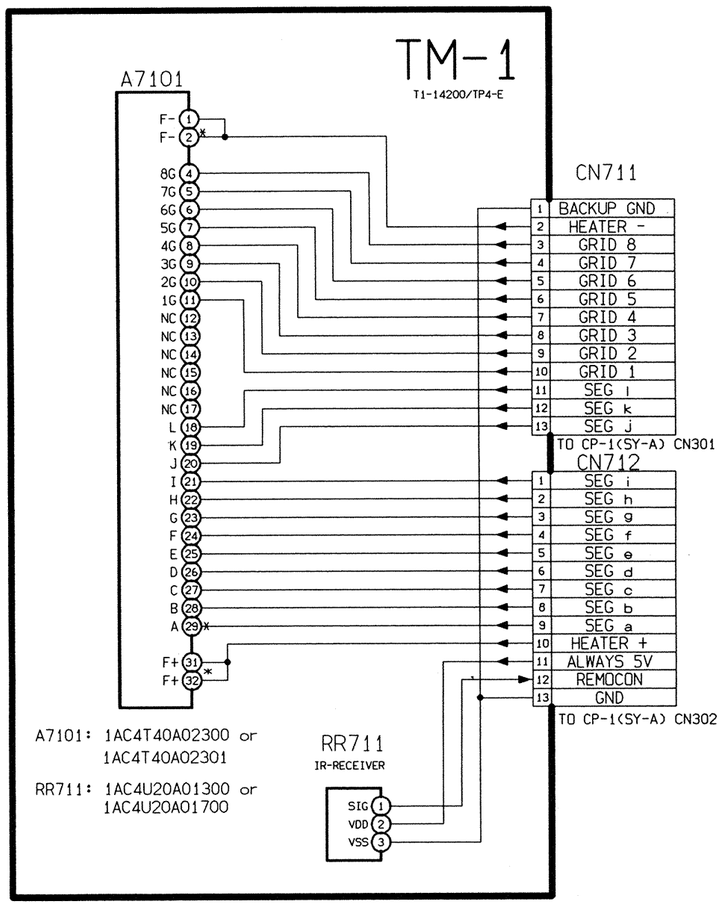
ON SCREEN (IC321) WAVEFORMS

(MODE: REC EE/ON SCREEN)

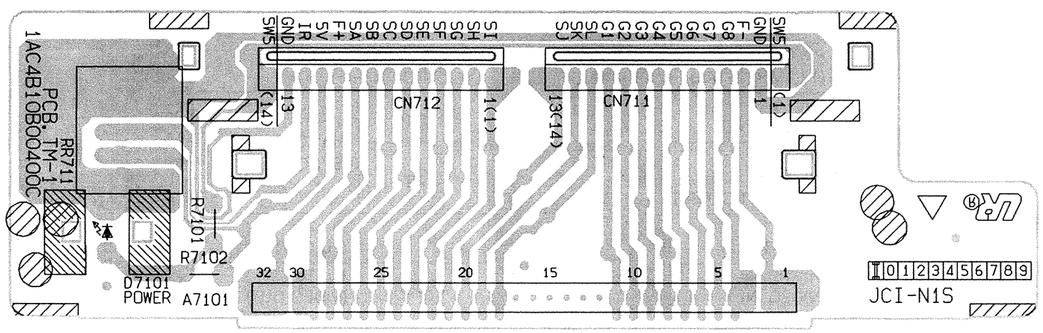
TEST LOCATION	WAVEFORM	LEVEL	TEST LOCATION	WAVEFORM	LEVEL
Pin 5 (17.7MHz X-TAL)		2Vp-p	Pin 19 (CV cr)		2Vp-p
Pin 6 (17.7MHz X-TAL)		3Vp-p			
Pin 14 (HALF TONE)		5Vp-p	Pin 20 (SYNC IN)		2Vp-p
Pin 16 (VIDEO OUT: WITH ON SCREEN)		2Vp-p			
Pin 14 (HALF TONE)		5Vp-p	Pin 23 (PD OUT)		4.5Vp-p
Pin 18 (VIDEO IN)		2Vp-p	Pin 16 (VIDEO OUT)		2Vp-p

WF-UFO-TP4

TM-1 BOARD DISPLAY (FLD)

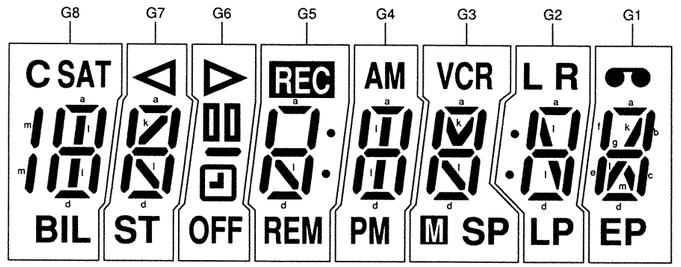


TM-1 P.W.B.



A7101 DISPLAY (FLD) GRID/ANODE ASSIGNMENT DRAWING & TABLE

GRID & SEGMENT ASSIGNMENT



ANODE CONNECTION

GRID / SEGMENT	G8	G7	G6	G5	G4	G3	G2	G1
a	C	◁	▷	REC	AM	VCR	L	🕶
b	SAT	k	▯▯	—	—	k	R	k
c	a	a	▬	a	a	a	a	a
d	b	b	◘	b	b	b	b	b
e	c	c	—	c	c	c	c	c
f	d	d	—	d	d	d	d	d
g	e	e	—	e	e	e	e	e
h	f	f	—	f	f	f	f	f
i	g	g	—	g	g	g	g	g
j	l	l	—	l	l	l	l	l
k	m	—	—	• •	—	M	• •	m
l	BIL	ST	OFF	REM	PM	SP	LP	EP

GR-02300